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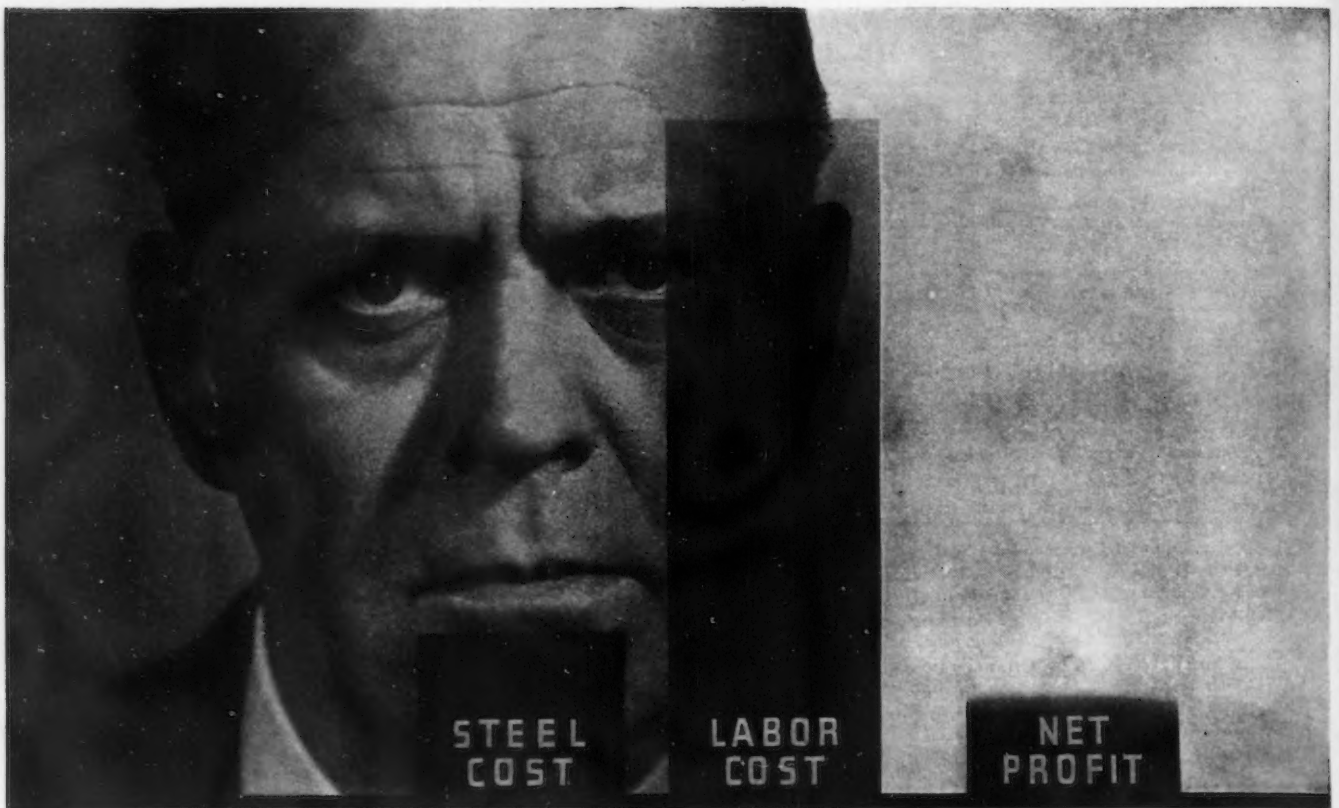
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MARCH 2, 1939

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Rabbits Belong in Hats

ONCE upon a time there was a land known as FeDoRa, because of the fact that it was famous for its white rabbits which were produced from hats. This you will note was a reversal of the procedure followed in other places, where hats are produced from rabbits, their fur being a principal component of hat felt.

FeDoRa also differed from other countries in that whereas in most lands it was customary for people to skin rabbits, in FeDoRa, the rabbits turned the thing about and usually skinned the people.

One may well ask why the inhabitants of FeDoRa tolerated this strange practice, as they did for quite some time. The explanation is simple, being based on the well known psychological effect that brings crowds to bull fights and prize fights to see somebody else being skinned.

The men in charge of white rabbit production, being highly skilled in the principles of mass-psychology, took care at first to direct the attention of these **dear** little pets—their cost being \$20 billion—to what they called an unpopular minority. But first it was necessary to find one.

That was not such an easy job. The minority could not be too small, for that would not be sufficient to maintain white rabbit production. And in a peaceful democracy, such as FeDoRa was before these things took place, it had been a case of live and let live among minorities and majorities, with no hard feelings between them.

Of course, such minorities as racketeers and kidnapers were decidedly unpopular even as now, but they were too hard to catch and their skins too tough even for the mightiest of the white rabbits. Tax dodgers might have served as an unpopular class, but there were quite a number of these even among the white rabbit managers, and no one is going to deliberately set out to get himself skinned.

At last came the inspiration. "Let's sick the white rabbits on the minority known as the Busi-Nessman. His skin is tender, he is inarticulate and pays little attention to politics. And while he is neither popular nor unpopular at present, it won't take more than a few millions of dollars worth of propaganda to make him the goat for all of our troubles."

So the Busi-Nessman became the victim of the ferocious white rabbits, to the enjoyment, for a time, of the onlooking majority and the other minorities. But the rabbits had acquired a taste for blood and after properly skinning this minority group, they began to turn their attention to the audience. And when the majority began to feel their teeth, it was not long before the rulers received a mandate from the "people."

It is said: "Hereafter rabbits may be put into hats, but must not be taken out of them."

J. H. Van Doren



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Modern Founding for Canada's Cars

By J. E. LINABURY

*Saginaw Malleable Iron Division
of General Motors Corp.*

THE composite accessory division of the General Motors Corp. in Canada—McKinnon Industries, Ltd., St. Catharines, Ontario—is unique in that it makes parts which in the United States are distributed among 11 separate factories.

The gear department at St. Catharines makes transmissions, front and rear axles, differentials, and steering gears; the small parts department makes spark plugs, generators, small motors, shock absorbers, and hydraulic brake parts; the forge department supplies the necessary drop forgings; and the malleable iron foundry, started in 1900, furnishes the malleable castings for the various other departments besides supplying many outside customers with hardware, chain and other castings.

For some time the management felt the need of making gray iron castings, and also modernizing the 38-year-old malleable iron foundry.

The problems encountered in designing a new foundry to meet these wishes were varied and difficult. As no additional land was available, it was necessary to demolish the various old foundry buildings, and build and equip a new foundry on the same site that would take care of the malleable requirements, which were about 60 tons per day melt, and, in addition, provide for making gray iron motor car castings requiring about 125 tons per day melt. These castings ranged from shock absorber and hydraulic brake parts to cylinder blocks and other automobile motor castings, which had to be furnished to a number of different metal specifications from soft iron to the dense iron hydraulic parts and the harder cylinder iron castings. While the old buildings were being removed and the new ones erected, it was necessary to keep the malleable foundry going at full production without even the usual two weeks' shutdown for inventory.

All this was accomplished and on only one day was production stopped during construction and changing over. To do this, it was necessary to put the malleable operation into about one-third the space formerly occupied and use the remaining space for gray iron with its larger core department and the increased pattern shop.

This was accomplished by changing over from the air furnace and floor molding to continuous melting and the use of mold conveyors and sand handling equipment. Similar equipment was provided for the gray iron section. The new building had to be arranged and designed to fit in with the old operations and equipment, which must continue production during construction work until the new methods could be provided.

A second problem which had to be faced before the project could be started was how it would be possible to supply at least three different mixtures of gray iron continuously all day and use but enough metal to keep one cupola operating continuously. (Many foundrymen said it could not be done.)

The solution was this: As the principal difference in these various mixtures is the carbon and silicon content, the gray iron cupola would melt only soft iron high in carbon and silicon and when a ladle of harder or denser iron was required, a certain

amount of the low carbon, low silicon iron from the malleable iron cupola would be added. By properly proportioning these two metals, a wide range of mixtures was available. Where alloys were required, they were added in the ladle. Metal mixed in this way seemed to have a finer, denser structure without making the thinner edges difficult to machine.

With these conditions provided for, the arrangement and design of the building was started. The metal storage yard and melting operations were placed at the north end of the site so that the 90-ft. span overhead traveling yard crane could be used to handle steel for the forge shop also, which was located north of the foundry site.

It was also decided to make the 32-ft. wide bay on the east side along the street, two stories in height, putting the pattern shop and storage upstairs and using the lower floor for boxing and shipping export chassis parts. The crane could then be used for loading the large cases on flat cars. The same crane would handle the foundry sand, coke and metal.

This arrangement placed the shipping of castings at the south end where it was most direct and convenient for trucking to the manufacturing plants.

In a westerly direction from the export department were placed the core room, the gray iron foundry and the malleable iron foundry.

The design and architecture of the building, approximately 330 x 336 ft., was handled by the company's plant engineering department. The main structure consists of one two-story bay 32-ft. wide, extending north and south and seven 42½-ft. bays arranged so that every other bay has its roof about 8-ft. higher than the adjoining bays, thus forming a monitor roof construction. The sides of this monitor are filled with centre pivoted ventilating sash affording an abundance of light and fresh air for all parts of the building. The walls of the building are of brick and glass and the roof of precast hydite. The roof is covered with a smooth surface asbestos roofing to facilitate sweeping off the dust and cinders.

The clear space under the roof

trusses in the molding and core departments is 22-ft. leaving ample space for the sand distribution equipment and core ovens. At the south end in the cleaning department and shipping, the clearance is 14-ft.

The floors in the melting and pouring section are of hard sharp cornered fire brick. The rest of the floors are armored concrete.

The heating system has been designed to help in the ventilation. In winter, warm air from unit heaters is brought by ducts to about 18 in. above the floor so that the floors are warm and free from cold drafts and the men do not have to work in currents of warm or cold air. This hot air at the floor furthermore raises any smoke or fumes that might settle near the floor. In the summer, the fans furnish a constant supply of fresh air to the interior of the building and overcome the oppressiveness of hot, dead air.

Directly north of the foundry and extending its entire width, is the metal storage yard and the incoming railway tracks. This yard is covered by a 90-ft. span, 5-ton electric traveling crane built by Herbert Morris, Ltd. A 48 in. magnet is used for handling the metal and a $\frac{3}{4}$ -yard motor operated grab bucket for the sand, limestone and coke.

The sand is stored in three concrete bins, each with a capacity of 800 tons, directly north of the core room and opening into it. It is dropped in by the bucket through long hatchways in the roof. Portable covers keep out the weather.

West of the sand storage is the metal yard, located behind the cupolas. Metal is stored on the ground and in 12 steel lined bins with bottoms that slant toward the scale car track. There are six separate compartments at the east end for the gray iron materials and six for the malleable, at the west end. In front of the metal bins and above the scale car track are four coke bins and one limestone bin, each

of one-car capacity.

About 4-ft. from the face of the building is the scale car track with two scale cars, one for each cupola, extending along the front of the metal bins and under the coke bin so that the metal can be raked into the charging bucket on the car and the coke dropped from above.

These bins form a shelter for the scale car crew, keeping out the rain and wind. In the winter the ends are closed in to further protect the workmen from the cold weather.

The scale cars are



Mold conveyor for



Covered insulated mixing ladles. The one on the left is for malleable iron, the one on the right for gray iron.

electrically driven and equipped with dial scales. On the scale platform of each is a section of heavy roller conveyor for removing the loaded buckets and putting on the empties.

The contents of the bin are arranged in the order of charging the materials so that the scale car, starting at the end with an empty bucket, will be loaded when it reaches the discharge point either side of the center line of the bins which is also the center line between the two cupolas. Centrally behind the two cupolas three parallel sections of heavy roller conveyor are set in the floor extending to and on the same level as the rolls

on the scale car. When loaded, the charging bucket is rolled off the scale car to one of the outside conveyor sections; the east one for the gray iron and the west one for the malleable iron cupola. A slight pitch to the conveyor aids in the operation. The center section of the conveyor is for the returning of the empty buckets from either cupola.

Supported from the roof of the charging floor is a charging hoist that swings from a central pivot on a circular track. The end of this hoist swings over an enclosed hatchway which is directly over the ends of the three roller conveyors from the scale



for malleable iron foundry.

buckets can be used for both. Each is equipped with a wishbone for holding the cone bottom buckets. As the charging floor is entirely enclosed, the charger is not exposed to the outside weather.

The blowing equipment, consisting of two Ingersoll Rand turbine blowers with automatic air weighing equipment, is located on a mezzanine floor below the charging floor.

The 2500-lb. malleable iron charges consist of approximately 35 per cent steel, 15 per cent silvery iron and 50 per cent returns. From

sprue, 2 in. in diameter, is then poured to make sure that there is no mottling of the iron.

The electric furnace is located directly at the head of the two mold conveyors making the lighter type of castings so that the pourers can come directly to the furnace and not lose temperature by a transfer. A little to the left is a third conveyor for the heavier castings.

The pouring ladles are of the covered insulated type made by the Modern Equipment Co. and are carried on Cleveland tramrail trolleys and track. The pouring platforms are at conveyor height and are made of subway grating.

The conveyor and sand handling equipment was furnished by the Link-Belt Co. The conveyors are of the car type and the molding loops, with the molding machines inside, are ap-

proximately 125 ft. overall in length. The conveyor for the larger castings is of heavier construction and the loop is wider, making room for larger molding machines. The first two lines have 14 molding stations each while the latter has ten.

The molding machine equipment consists of Osborn squeezers for small flask work and 14 in. jolt strip squeezers for the larger flasks. The castings vary in size from harness buckles to truck differential carriers.

After pouring, the molds pass along the return

side of the conveyor through a long ventilated cooling hood which takes off the smoke and steam. On reaching the lower end of the loop, the molds are plowed or dumped onto a Simplicity vibrating shake-out screen. The flasks and bottom boards are pulled off and returned to the molders; the sand passes through the screen to a reciprocating conveyor, in a tunnel beneath the floor and the castings slide off the screen to a long oscillating feeder in the same tunnel.

This feeder extends past the end of the three shake-out screens, receiving castings from each, and slowly conveys them to a 42 in. wide apron cool-



Shakeout screen for small castings.

car on the ground floor so that the charging bucket can be picked from the conveyor, raised through the hatchway and swung into either of the cupolas. The operator standing on the floor under the center pivot is not in line with the heat from the cupola doors and can move about to level off charges, put in alloys, and other such details that may be looked after from the charging floor.

The cupola equipment consists of a No. 6 Whiting cupola for the malleable iron and a No. 8 cupola for the gray iron. The doors and stacks above the charging floor are both the size of the No. 8 so that the same

the cupola, the metal flows continuously into one end of a 4-ton cylindrical covered receiving ladle. Fused soda ash is added at the spout for desulfurizing. The metal passes horizontally through the ladle to the spout at the other end from which it is poured into a one-ton transfer ladle and taken to an electric arc furnace for superheating and adjusting the mixture. This is a hydraulically operated nose tilt Pittsburgh Lectromelt furnace, holding about three tons of molten metal. With each molten metal addition, a small amount of clean steel is added to prevent graphitization and to reduce the carbon content. A test



Mold conveyor for small castings in gray iron foundry.

ing conveyor running at a right-angle. The end of the oscillating conveyor is so beveled that the hot castings are evenly distributed across the apron conveyor. The arrangement is such that the larger castings have a longer travel giving them more time to cool. This conveyor, moving about 6 ft. per min., takes the castings from beneath the floor, in a direction parallel with the mold conveyors, to the stations where the gates are broken off and the castings placed in tote boxes. The gates are left on the conveyor, carried through the north wall of the building to the metal yard and dropped onto a grating which slides them into a pit under the crane to be removed by the magnet to the charging bins for remelting. They thus make the complete cycle without being trucked or handled except in removing the gates.

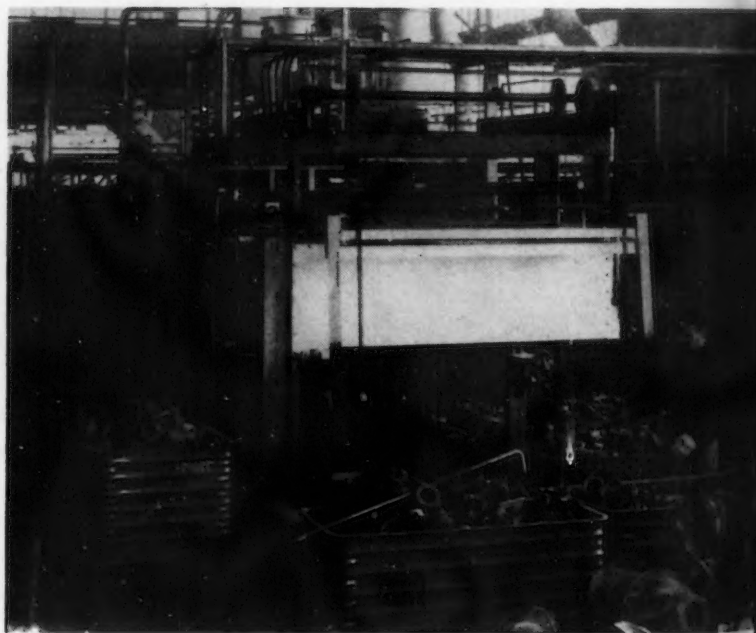
The sand from the end of the shake-out screen is conveyed by the reciprocating conveyor through the tunnel to the hot sand bucket elevator which delivers it to a magnetic pulley belt where any metal is removed and feeds it to a vibrating screen of $\frac{1}{4}$ in. mesh. From the screen, another belt conveys it over the two 30-ton sand hoppers where it is plowed off into

one or the other as desired. While one storage hopper is being filled, sand from the other is being fed by a measuring hopper to the 8-ft. Simpson mill below. Here the specified amount of water, sea coal and bond are added and the mixture is milled. From the mill, the sand goes by belt to an elevator, then through an aerator

and then by belt back to the molders where it is used as required. A powerful exhaust system sucks the dust from the hoods over the shake-out screens, from the top of the hot sand elevator, from the screen, the Simpson mixer and the aerator. This removes the dust from the foundry and the fines from the sand, thus improving the working conditions, cooling the sand and opening it up. The dust passes through a spray and over wet baffle plates so that but a very small amount is discharged to the atmosphere. The sludge is washed down by water to the dump at the west of the foundry.

Annealing and Cleaning

When the castings are picked from the cooling conveyor, the gates and a few fins are broken off but there is no other cleaning operation. The castings are classified as to size and put into tote boxes accordingly. These boxes, when filled, are moved across the aisle into the week-end storage or placed for loading into the annealing trays. The annealing equipment consists of two electrically heated controlled atmosphere roller-rail,



Loading end of electric

pusher-type furnaces built by the Electric Furnace Co., Salem, Ohio.

Each furnace takes two rows of 30 x 24 in. alloy steel trays. Across the front of the furnace extends a track built into the floor on which is a light car with a beam scale. On the platform of the scale car are roller rails which match in height and gage

with the rails in the furnace. An empty tray is rolled onto the scale and the car moved to the tote boxes with the castings which are loaded into the tray. When the desired weight has been loaded, the car is pushed to a position in front of one of the furnaces and the tray rolled onto the receiving platform in front of the furnace where it remains until an automatic signal announces that the tray in the furnace vestibule has been pushed into the furnace and the inside vestibule door is closed. Then the outer door is opened and the freshly loaded tray is pushed into the vestibule and the outer door is closed. In the furnace, the metal is quickly heated to 1500 deg. F., then slowly heated to 1725 deg. and held there ten or more hours. The metal then is quickly cooled to 1400 deg., slowly cooled to 1300 deg. and taken out on the discharge platform at the far end. The above temperature changes take place as the tray is pushed from one position to the next in passing through the furnace. The temperature in each zone is controlled by Leeds & Northrup equipment and the timing by an automatic control clock.

the tray are dumped into the loader of a Pangborn Rotoblast. From this same position, the tray is pushed off the car onto a roll conveyor which returns it between the furnaces to the charging end.

After shot blasting, the castings are discharged into another car with a bottom dump which takes them to the side of the machine and slides them onto a sorting belt. This belt takes them under an aisle and up an incline to the sorting station at the west side of the cleaning room. Each annealing furnace has a normal capacity of 170 tons per week. One operator per shift does all the packing and charging and another takes care of the unloading and shot blasting.

From the sorting belt, the castings are sorted and classified and sent on tote boxes to the sprue cutters, the grinders, or the mills as required. These operations are at right angles to the belt so that the parts can be picked off the belt directly at the head of the line for the next operation. The mills are 36x48 in. Whiting with direct motor drive on each. The grinders are No. 24 Norton type built by the Fordsmith Machine Co. with the mo-

tors in the base and the speed changed by moving the belt.

Castings requiring straightening pass on across the aisle to two Hydraulic Press Mfg. Co. Fastraverse presses and a drop hammer.

In the shipping room is a Toledo platform scale with a counting attachment and storage bins for the castings. A covered truck ramp at the shipping door brings the transport platforms to the floor level, while castings for the plant's own consumption are taken by lift truck directly to the various departments.

Gray Iron Practice

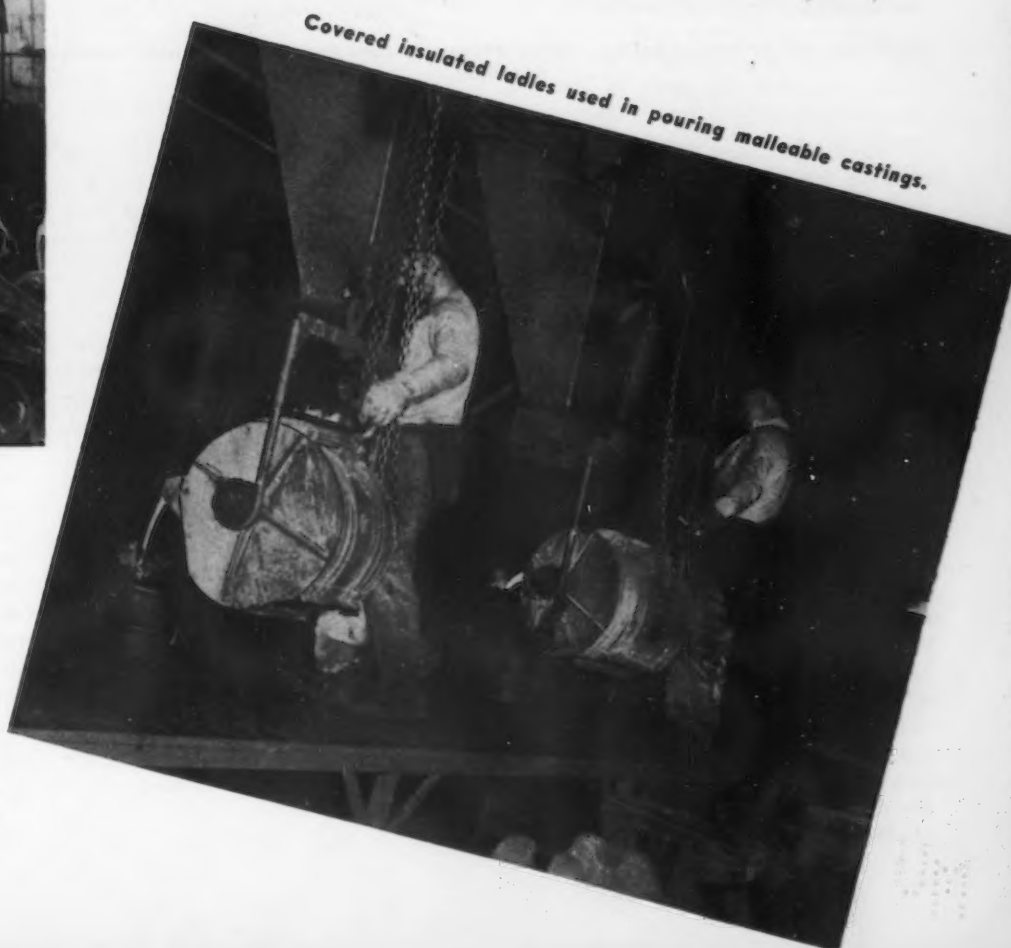
Located to the east of the malleable iron molding department is the gray iron molding department with but a low division wall between to keep the castings from getting mixed. The cupola for this department melts a soft gray iron; the metal for cylinders, pistons, shock absorbers, etc., which is a harder or denser metal, is produced by mixing a proportional amount of the hard iron from the malleable iron cupola with the soft gray iron. The mixture produces a tight, fine-grained iron that seems to have less tendency to chill in the smaller sections than if a similar analysis iron were melted in one cupola. Ladle addition of nickel and chromium are made where these alloys are required.

Bull ladles filled with the desired



annealing furnaces.

Across the discharge end of the furnace is a track similar to that at the charging end but instead of the scale is a tilting frame. When the hot tray is pulled from the furnace onto this frame, the car is pushed along the track to a position in a line between the two furnaces where the contents of



Covered insulated ladles used in pouring malleable castings.

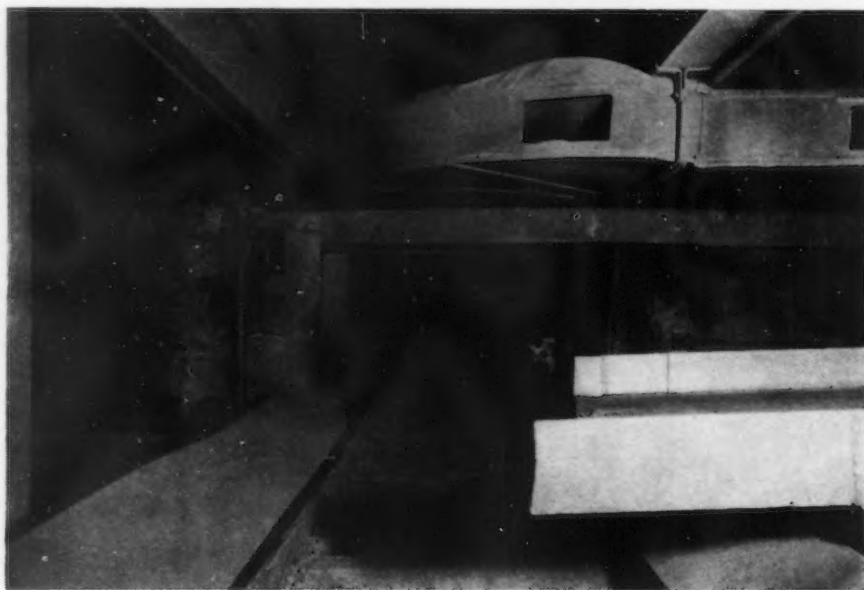
mixture are taken to the various stations and transferred to the pouring ladles, thus giving a more complete mixing.

Each conveyor has its own pouring loop and pouring ladles. The first line next to the malleable section is for the heavier motor castings such as cylinder blocks, heads, flywheels and truck brake drums which can be made of the same iron. All conveyors are of the car type with antifriction bearings and heavy steel plate tops. On the cylinder conveyor there are 77 plates, 4 ft. long and 2 ft. wide.

The cylinder block and head molds

dragged over a Simplicity knock-out vibrator and the cores shaken out onto a screen below. Weights on this screen break up the coarse pieces too large to pass through the screen. The sand and smaller lumps pass through the screen into a concrete pit filled with water and are sucked out by a hydraulic dredge pump. The discharge of this pump is through a long pipe which extends along the building and over the railroad tracks to the dump where the sand is deposited and the water runs off into the canal.

The bails of the cooling baskets carried on this cooling conveyor are short



Discharge end of reciprocating cooling conveyor, onto apron cooling and sorting conveyor.

are made on Osborn jolt squeeze strip molding machines while the lighter molds are made on Nichols and Milwaukee molding machines.

After the molds are poured, they pass through a ventilated tunnel until they reach the far end of the conveyor loop. Here the copes are shaken out while the casting and drag pass around the end of the loop through another tunnel and are shaken out as they start back on the molding side. Simplicity shake-out screens are used for the gray iron also.

At the discharge end of the shake-out screen, a hoist picks up the cylinder blocks by means of tongs which lock in position and hang them on the hooks of the overhead chain cooling conveyor. Other castings are placed in open work baskets and hung on the same conveyor. This conveyor first travels north to the core knockout room where the cylinder casting is

enough so that the baskets do not touch the knock-out vibrator and are carried with the cylinder blocks back to the south till they reach the cleaning room where they are taken from the conveyor and sent to the various cleaning operations. The cylinder blocks are placed on a roller conveyor and passed to a swing grinder where the top and bottom surfaces are ground. They are then tumbled, chipped, handground, sand blasted and water tested along a line of roller conveyor. Other castings are tumbled, ground and finished as necessary.

On the second molding line in the gray iron foundry are made the clutch housing, transmission case, manifold and intermediate size castings. The clutch housing drag is made on a 14-in. Nichols machine while the core of green sand is made and set on an Osborn rollover squeezer. After the drag half of the mold is made, it is

placed over the core box on the roll-over machine and the two rolled over together and then placed on the conveyor. The transmission core is green sand topped on a rollover machine along the mold conveyor line. The third conveyor is for the small castings made in snap flasks, such as hydraulic brake cylinders, shock absorbers, etc. These molds are made on squeezer machines using bands instead of slip jackets. At the shake-out, the molds are plowed off the conveyor onto a vibrating screen while the operator puts the bands and bottom boards back onto the conveyor. These castings and those from the second conveyor are dumped into the cooling baskets and lifted to a second slow moving chain cooling conveyor where they pass slowly back and forth overhead for 45 min. and finally down a loop where the baskets are dumped on a sorting table for separation from the gates and general classification. From here they go to the shot blast machines or tumbling barrel as required. After cleaning and grinding, the castings are inspected and shipped or put in storage.

Between the third conveyor and the core room is the brake drum department with a turntable mounting ten machines that centrifugally cast brake drums in metal molds and after cooling the proper time, eject them onto an apron cooling conveyor. These drums are cast with the backs in place and have no gates to remove or grind nor is it necessary to machine the outer surface or face.

The capacity of the table is about 250 drums per hr., most of the time being taken to cool the mold.

The sand for the gray iron is conditioned the same as for the malleable but there are two 8-ft. Simpson mixers in the system instead of one to provide for the greater requirements.

Core and Pattern Facilities

The core room is located east of the gray iron foundry and south of the sand storage bins. The sand is brought from the storage and dried in a vertical dryer of special design to take up a minimum of floor space. For mixing the sand are a Baker Perkins mixer and a 6-ft. Simpson mixer. The sand is delivered to the core makers by truck. The core making equipment consists of six Osborn core blowers, several rock-over and roll-over machines and some special machines besides the bench work.

The baking equipment consists of six Foundry Equipment boxtype ovens

(CONCLUDED ON PAGE 68)

Revere

Mechanizes

Brass

• • •
By R. E. FALK

Vice-President of Revere Copper & Brass, Inc.
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Production

STREAMLINING is the keynote of the new \$3,000,000 brass mill of Revere Copper & Brass, Inc., at Rome, N. Y., mill of which every part was deliberately planned to facilitate proper handling and flow of material from raw materials to finished product—smoothly, continuously, in minimum time and with maximum control of quality.

In this mill are integrated and coordinated into a complete and perfected system all improvements previously developed in the entire Revere organization, with its six rolling mills throughout the country. These six plants gave a broad background of experience which hardly would have been available had previous operation been confined to a single plant.

Maximum elimination of hard muscular labor was especially sought in this new Rome unit, because thereby the strength and attention of the operating men will be conserved for concentration on tasks requiring knowledge and skill. Reduction of exhausting manual effort also will minimize accidents associated with fatigue. In furtherance of the streamlining objective, standard mill equipment was fitted into a pattern where possible. But where a "bottle-neck" was encountered, which previously had slowed up operations or imposed back-breaking effort, and which no known equipment could eliminate, Revere engineers devised means of circumventing the bottle-neck.

The new brass mill has a number of such devices—machines of original design that contribute much to maintain and accelerate smooth, unhurried yet rapid flow of production. Many of these pieces of equipment are shown on the following double-page spread of pictures, and outstanding features are:

An "escalator" conveyor system on which the bars travel and are automatically fed and re-fed into the breakdown mill, each sequence automatically controlled by a series of "electric eyes" (see photo 5, next page).

A continuous flat-slab—annealing furnace through which bars travel steadily and are automatically conveyed back to the mill, or to the overhauling (scalping) machine. Thus, the usual method of loading and unloading on annealing pans is eliminated (photo 2).

A system of material reservoirs between each operation and the next increases flexibility and continuity of production, assuring a steady flow of work to rolls, annealing furnaces, picklers, etc., all along the line.

An 80-ft. straight-line pickling machine uncoils the metal, then pickles, scrubs, washes, dries and recoils it in a continuous operation (photo 6).

Finish annealing furnaces of new recirculating and recuperative types, equipped with recording automatic-control instruments regulating furnace

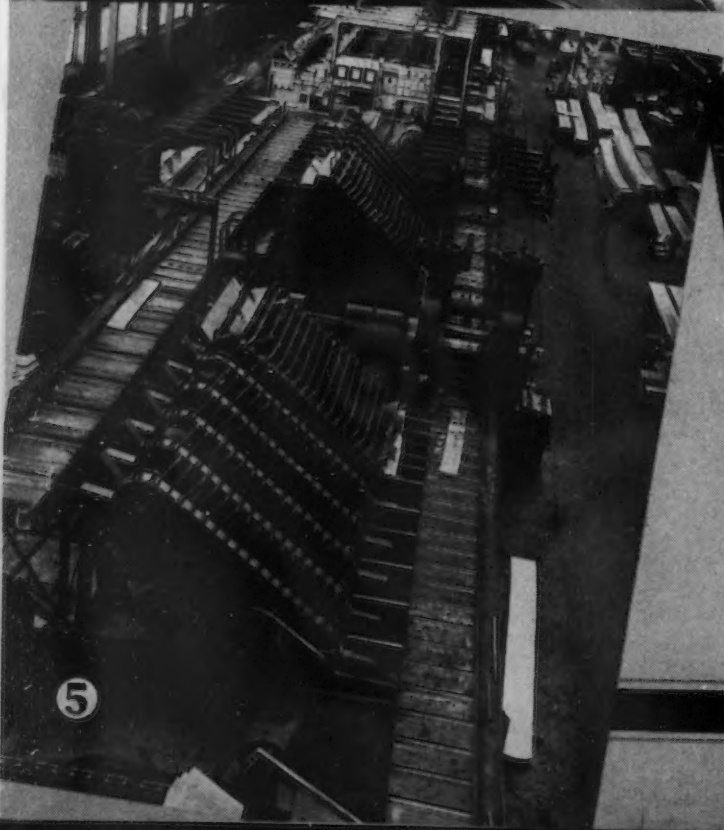
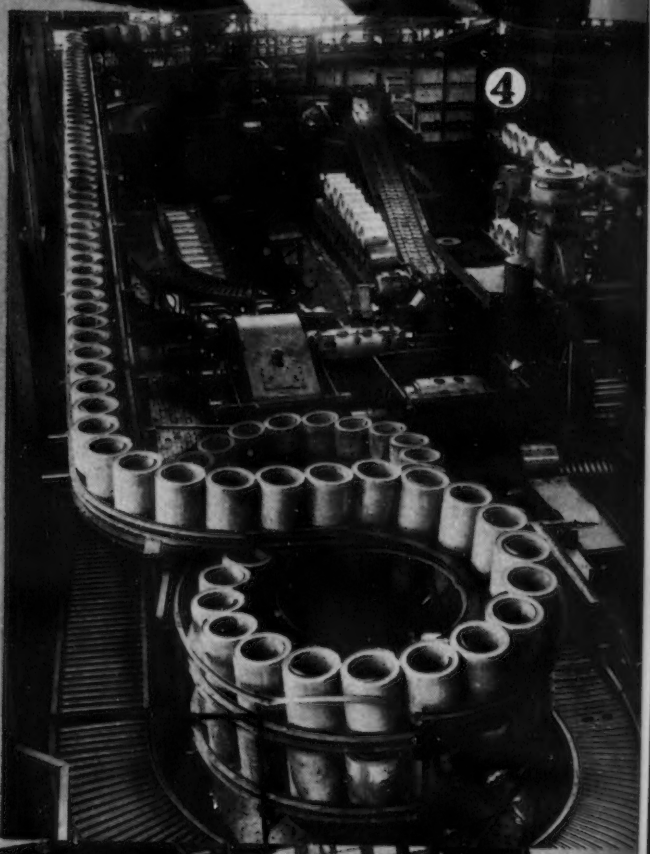
and metal temperatures, impart to the metal pre-determined and closely controlled characteristics.

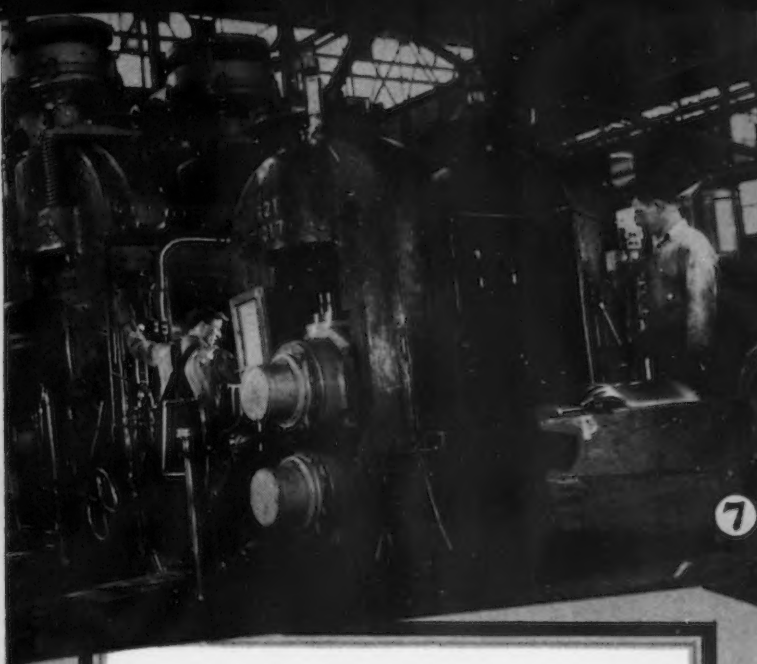
A system of remote-type instruments automatically records in the plant superintendent's office the operation of every machine in the entire mill (photo 11).

All the machines and appliances just mentioned are not necessarily novel in principle, but in the new Rome mill they have been brought together in the latest and most advanced form. But several of these machines are wholly or in part new, having been originated by the engineering staff and developed to the point of practical, efficient operation in Revere commercial production.

The effect of this highly modernized mechanical set-up, aside from speeding output and improving quality, is to make the production layout much more compact. The new mill is designed to produce steadily an output of 2,000,000 lb. of metal per month within a ground area of 72,000 sq. ft. This ratio, it is believed, has never before been approached in the industry.

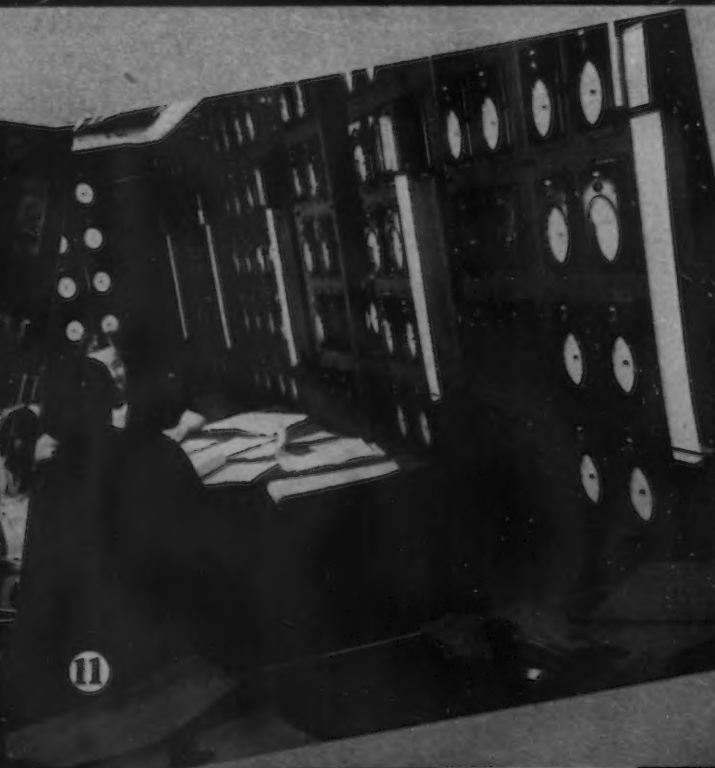
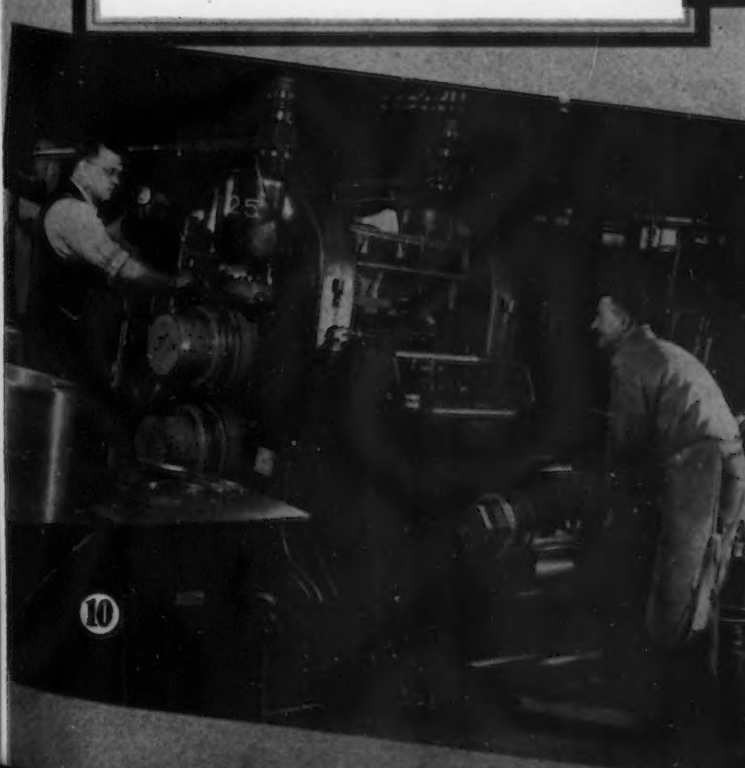
It is axiomatic that the quality of the mill output depends basically upon the quality of the slabs supplied by the casting shop. The electric melting furnaces are so arranged as to minimize the handling of the raw metal and castings, and special ventilating facilities draw off the fumes from each furnace individually, assuring every





The Streamlining of Brass Manufacture

RAW materials are melted in electric furnaces and cast into 6-ft. water-cooled molds (1). The slab ends are sheared off, and ten slabs are stacked so that they can be mechanically lifted to slide down one at a time to the horizontal conveyor which carries them to the breakdown rolls (3). The unique conveyor system feeding the breakdown mill (5) consists of an upper level horizontal unit, a lower level horizontal unit and two "escalator" conveyors. After breakdown the bars "walk" through an annealing furnace (2), then are overhauled, thence go to the first run-down mill (4), a four-high unit which coils the material during reduction. Metal is shown in a storage reservoir of conveyor system (4). The lower level conveyor transports coils to mill for further passes, and as coils emerge from rolls they are taken by a power driven conveyor to the upper level where they can be sent back to the mill for further passes, or sent to the annealing furnace in background, all of which is controlled by levers and push buttons. The metal is then uncoiled as it begins its trip through a straight line pickling machine (6), then rolled again in the second run-down mill (7), annealed, rolled in the third run-down mill (8), pickled and scrubbed in a double-deck unit (9), and finished in a single stand mill (10) equipped with tension-blockers and anti-friction and recoiling devices. The superintendent's office (11) has electrical indicating instruments which give a record of operation of all units in the entire mill at any time.



casting shop employee complete protection against fumes (photo 1).

The metal is cast into 6-ft. heavy slabs which are delivered by crane to inspection benches, whence they are carried by conveyor to shears for gating. The bars are gated by a specially-designed guillotine-type shear, in and out of which they are moved automatically and stacked in piles of ten for delivery to the rolling mill.

At the rolling mill the bars are mechanically lifted, one at a time (photo 3), from the stack and passed through the breakdown mill. Leaving the rolls the bar is carried around the mill on an escalator system for a second pass. The number of rides the bar gets on the escalator depends upon the width of the bar being rolled. The feeding of the slabs to the mill is governed and timed automatically by photo-electric relays which act like traffic policemen—giving the bar the "go" signal to enter the rolls only when its predecessor has moved out. An electrical recording instrument in a separate building housing the superintendent's and production department offices makes a record of the exact time of each pass in every mill. In addition, every operation of every other machine in the entire plant is similarly recorded, giving the mill executives a continuous, comprehensive and dependable picture of mill operations (photo 11). There is thus a prompt indication of the center of trouble when production is interrupted or lagging. Records from these instruments are available permitting the plant management to check exactly the working time of any machine on any single operation, or any number of operations, or over any desired period. The data is all on file. Study of the charts enables the management to eliminate many preventable losses of man and machine time by adjusting and coordinating all operations to harmonize for greatest efficiency.

Walking-Beam Furnace

When it is necessary to anneal the bars between breakdown rolling operations, they are delivered by conveyors to a walking-beam furnace, then back to the rolls for more passes. After the bars receive the final breakdown pass they are again delivered to the walking-beam annealing furnace for the final flat anneal. This walking-beam slab-annealing furnace is new to the brass industry. Formerly the bars were piled on pans in stacks. Loaded with 5000 to 10,000 lb. of metal the pans were pulled in and out of the furnace. This operation required considerably physical labor and the an-

nealing results were never consistent.

At this stage the bars have grown from the original 6-ft. length to a length of approximately 25 ft. or more, and have decreased from a thickness of 2 in. to about 7/16 in. After leaving the overhauling machine, the bars are automatically stacked in piles, which are picked up by crane and delivered to the first rundown mill (photo 7). The 25-ft. flat bars are fed through this 4-high mill mechanically, are automatically coiled after the first pass. Here again the number of passes the bars receive depends upon the width of the bar and the gage desired. If the bars are to receive another pass, they leave the coiler on a conveyor and are delivered in front of the mill ready for the second pass.

If the bars require heat treating or annealing between rolling operations, they are routed on the conveyor to an annealing furnace. The coils leave the conveyor one at a time and travel through a roller-hearth furnace in one direction on a lower level, and back through the furnace in the opposite direction on an upper level to a conveyor, by which the coils are returned to the first rundown mill or to the pickling and cleaning machine, depending upon the finish and gage desired. This furnace is of the recuperative type, cold metal entering absorbing heat from hot metal moving outward, and here again Revere engineers eliminated use of annealing pans. Each coil of metal travels through the furnace separately, assuring even annealing. This type of furnace is new to the brass industry.

At this point the metal has become much thinner and therefore requires more exacting rolling and handling. But before these operations the bars require pickling and cleaning. The straight-line pickling machine (photo 6) is entirely enclosed, the work moving continuously in at one end and out at the other. The heavy coils are automatically uncoiled, pickled, scrubbed, washed, dried and recoiled.

Previously this operation involved much laborious and time-consuming effort. Also it never produced entirely satisfactory results, because it was impossible properly to scrub the metal in the vats. And it was a particularly back-breaking job because each coil had to be opened up by hand and the metal spread on trays and immersed by crane in the various solutions. But by treating the metal in the mechanically-opened strip it is made practicable to clean it in this machine rapidly and thoroughly, in a continuous operation.

Pickling completed, the brass is ready for further rolling. The coils are conveyed to suitable rolls for different types of rolling, depending upon the finish and gage required. Some of these rolls are set up in tandem (photo 8), following practice pioneered by Revere as early as 1929. The mills are equipped with electrically driven constant-tension blockers, or winding devices. Constant control of the winding tension is essential to accuracy in maintaining the desired gage. In the recoiler, also, harmful stretching of the metal is prevented by a device which governs the peripheral speed of the recoiler (photo 10).

Between rolling operations the brass is subjected to heat treating. Up to this ready-finish stage the annealing has been done in continuous furnaces, well adapted to the more general characteristics of heavy-gage metal. As the metal approaches the final stages, batch-type annealing is resorted to because of the specific treatment individual lots can be given. This individual treatment has been found necessary to obtain the varied characteristics demanded by present-day requirements, which are becoming increasingly exacting.

After the metal comes from the heat-treating operation it must again be cleaned. This cleaning is done in a continuous pickler, scrubber, washer and dryer, arranged in two decks to hold space requirements down to a minimum, and is designed to eliminate the human element as much as possible (photo 9). It also incorporates the principle of scrubbing in the reagent, as previously noted.

Throughout all the various rolling and cleaning operations the metal is checked at every step for gage, grain structure and hardness. It is now ready to be cut to size or slit to width, as specified by customer, and is given a final inspection for surface imperfections, gage, grain size, and other physical properties such as tensile strength, elongation, etc. The metal is then ready for packing and shipping to customer.

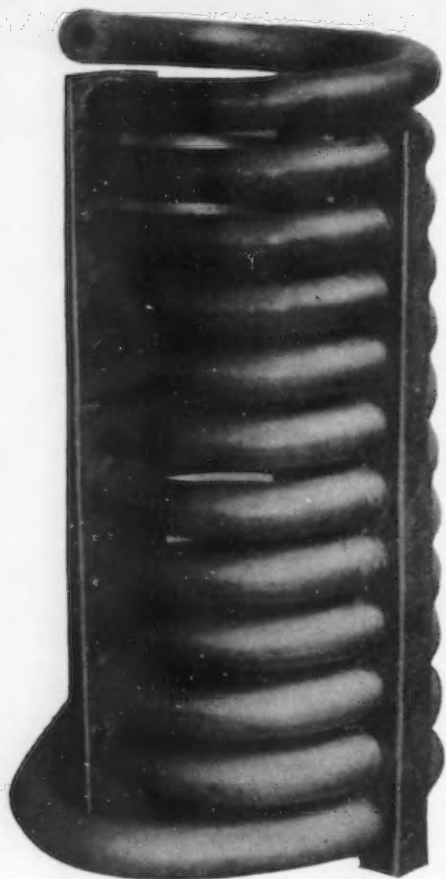
The degree of mechanization attained in this mill may fairly be considered revolutionary as compared to previous brass production practice. Understanding of the functions of the different units as they perform in orderly sequence, gives appreciation of what this mechanization means in promoting smooth, continuous production, eliminating heavy manual toil, and simplifying the problem of supervision and control.

Auto Industry Paragon of Modernization

THESE two pictures were taken in the Buick machine shop, one showing it as it was 20 years ago and the other today. Both are models of their time. The change in appearance has been accompanied by correspond-

ing changes in efficiency wrought through the installation of modern equipment with more efficient means of power transmission, improvement in lighting and machinery arrangement.





THIS special tellurium lead coil exemplifies the value of small alloy additions. Pipe is 1 in. I.D. and 11/16 in. wall, and 11 turns are made on a 14-in. center to center diameter. This assembly's supports are cast on the coil in one piece at Perth Amboy plant of National Lead Co.

The Right Metal in the Right Place

By ADOLPH BREGMAN
Consulting Engineer, New York

TO the manufacturer who is constantly faced by the problem of finding the best metal to use for his product, the variety of alloys available, the range of choice offered and the conflicting and overlapping claims of the producers of non-ferrous metals and alloys is, to say the least, perplexing.

The need for "the right metal in the right place" has always been present. Seventeen years ago, in a study of non-ferrous foundries,* it was evident that the most frequently asked question was, "What metal or alloy shall I use for this job?" Years ago this question was not so hard to decide since the choice was much more limited—commercial alloys were comparatively few. To be sure, the results were often far from satisfactory because the then existing materials had severe limitations. Today, in the quest for better materials to meet the more exacting demands of specialized service, the manufacturer is presented with a multitude of materials to choose from. The results obtainable and the service rendered by the best of these, for any particular job, are far in ad-

vance of anything in the past. But the very fact of increased numbers due to diversification and specialization is confusing to the manufacturer faced with the need for selection.

Within the metal working industries are scores of different types of users and producers of non-ferrous metal products. Among metal goods manufacturers, for example, are makers of caskets and burial vaults, clocks and time recorders, electrical goods, hardware, kitchen utensils, lamps and lighting fixtures, musical instruments, radio, phonograph and telephone equipment, toys and metal novelties, valves, pipe fittings, plumbing goods, and miscellaneous metal goods. The list could be extended to half a hundred. Among machinery builders are fully as many, all catering to different industries, such as baking, dairies, laundries, electrical equipment, railroads, pulp and paper, refrigeration, sugar, textiles, and so on.

In each of these classes, the problem of the right metal in the right place is paramount—and different. The diversity and specialization of properties now needed may be judged

from the many tests to which metal products are subjected: Resistance to corrosion and to chemicals; withstanding high temperatures, low temperature and repeated and rapid changes in temperature; coefficient of expansion; electrical resistivity; how extremes in temperature affect these properties; workability; machineability; ability to take and hold surface coatings—non-metallic and metallic, hot dipped and electro-deposited; bearing qualities; resistance to shock; and of course the "old reliable" tests—tensile strength, yield strength, elongation, hardness, etc.

By permutations and combinations, the number of alloys theoretically possible from even as few as a half dozen basic, commercial metals is beyond practical count; and, in fact, the number of alloys listed as having been actually made or used seems to approach an estimated 5000, to the understandable bewilderment of the manufacturer who is searching for the "one best material."

In spite of this seeming complexity, the problem is, in most cases, readily soluble. In the first place non-ferrous

metals are used, by and large, in spite of their higher first cost, because they have distinctive properties and serve a special purpose better than any other material. Those non-ferrous metals which form the basis or the major constituent of the alloys in commercial and industrial use are few in number: copper, lead, zinc, tin, aluminum, nickel and latterly, magnesium (and, of course, the precious metals used in the arts).

Used in the same fashion but in much lesser volume are cadmium and tungsten. The alloys may be simple or complex, but the major constituent in the combination should be something which is fundamentally suited to the conditions, or resistant to the attack, physical or chemical, to which the product is subjected. So, for example, if high strength is required, the major constituent of the alloy should be a high strength material. For rust or atmospheric corrosion, the major constituent is likely to be a material which in itself is rust resistant. For resistance to a specific chemical some material which has that property must generally be used. Although any property may be enhanced and developed, in some cases to a very high degree, by other constituents in an alloy, the important clue is most likely to lie in the original properties of the major metal. (This is the general rule, although there are some disconcerting exceptions.)

The requirements often call for a combination of properties. Perhaps a combination of strength and corrosion resistance, or perhaps strength and light weight, or perhaps retention of properties at elevated temperatures. Then the choice may have to be a compromise, with the emphasis laid on the most pressing needs.

With respect to these major constituents, or basic non-ferrous metals, it is found that certain trends have made themselves apparent. Metals of

increasingly high purity are being produced and have been found to be of the utmost commercial importance. Probably the most famous example is the revolutionary improvement in the

FIRST of a series of articles dealing with "The Right Metal in the Right Place," the objective being to aid manufacturers in selecting the most suitable non-ferrous metal or alloy for their products.

die casting industry effected by high purity zinc. Another is the interesting oxygen-free high conductivity copper. High purity aluminum is also available. From present indications, one of the very broad avenues for the progress of metal products certainly seems to be the greater use of high purity metals.

Another trend is the use of small additions of the more costly and even "rare" metals. These materials have produced some extraordinary improvements in alloys, seemingly far out of proportion to the small percentages used. An old example is the action of

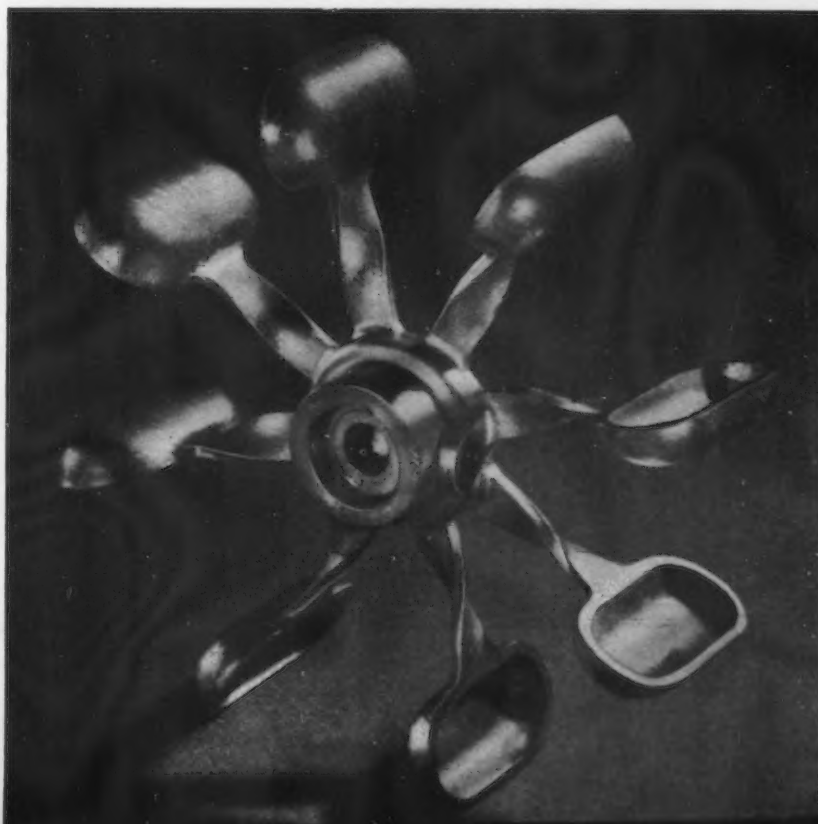
manganese when added to brass (about 60-40) to form "manganese bronze." A conspicuous modern example is beryllium which (under 2.5 per cent) has created a wholly new copper alloy.

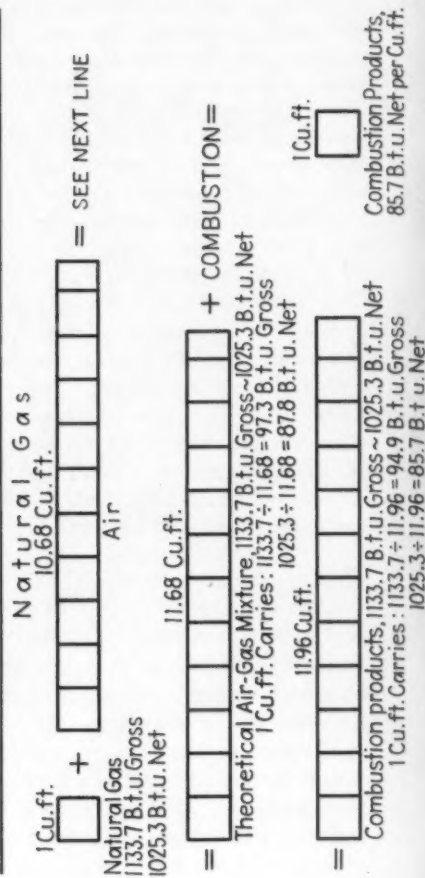
Other metals with improvements to their credit and possibilities ahead are calcium, cerium, chromium, cobalt, columbium, indium, osmium, rhodium, tellurium, titanium, vanadium and zirconium. Less expensive but very valuable and widely used alloy additions are nickel, antimony, bismuth and silicon. This trend has enormously increased the variety of materials available, with the result that, although the broad principles are still relatively simple, the final choice is complicated by the numerous variables introduced by the "addition agents."

Of course, the commercial factor—cost—must be kept under consideration throughout. It is no solution to any problem to find that a platinum-iridium alloy will do the work, unless the product can command a platinum-iridium return. It must be just as constantly borne in mind, however, that the word "cost" should never be limited to the confines of the word "price." Cost is not first cost but *overall cost*; cost over the whole life of the part, piece or machine. Cost also includes savings (or losses) in operation, and in some cases, even scrap or salvage value.

Later articles in this series will take up the individual non-ferrous metals and their alloys, in terms of the needs of the metal working and metal products manufacturing industries which use them. These articles will describe their applications and uses in the consuming industries, the new and promising developments which give them new uses, and the types of service for which they are recommended. The demands of these industries, their needs, and problems will also come under consideration.

It would have been well-nigh impossible to bend the arms of this casting into a usable shape without having available the high purity zinc alloys of today.





AIR - GAS VOLUME RELATIONS AND THEIR BEARING UPON HEAT DELIVERY

1 Cu.ft. 1.12 Cu.ft. Anthracite Gas 2.12 Cu.ft. 1.90 Cu.ft.
+ = + COMBUSTION =
Anthracite Gas 151.1 B.t.u. Gross
142.2 B.t.u. Net
1 Cu.ft. carries 151.1 ÷ 1.12 = 135 B.t.u. Gross
142.2 ÷ 1.12 = 127 B.t.u. Net

Theoretical Air-Gas Mixture
151.1 B.t.u. Gross
142.2 B.t.u. Net
1 Cu.ft. carries 151.1 ÷ 1.12 = 135 B.t.u. Gross
142.2 ÷ 1.12 = 127 B.t.u. Net

Combustion Products
74.9 B.t.u. per Cu.ft. Net

1 Cu.ft. + N - Butane 31.1 Cu.ft.
3353 B.t.u. Gross
3102 B.t.u. Net

1 Cu.ft. + Air 32.1 Cu.ft.
+ COMBUSTION =

Theoretical Air-Gas Mixture
3353 B.t.u. Gross
3102 B.t.u. Net
1 Cu.ft. carries 3353 ÷ 32.1 = 104.5 B.t.u. Gross
3102 ÷ 32.1 = 96.6 B.t.u. Net

= 33.6 Cu.ft.
Products of Combustion
3353 B.t.u. Gross ~ 3102 B.t.u. Net
1 Cu.ft. carries 3353 ÷ 33.6 = 99.8 B.t.u. Gross
3102 ÷ 33.6 = 92.3 B.t.u. Net

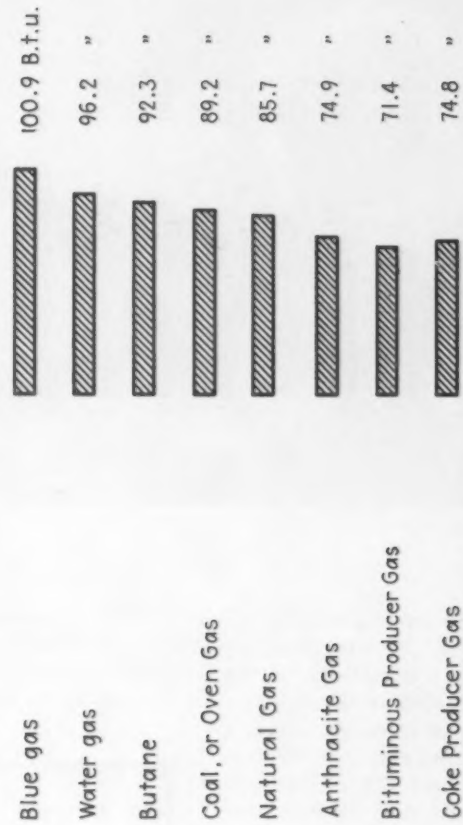
1 Cu.ft. Combustion Products
92.3 B.t.u. per Cu.ft. Net

AIR - GAS VOLUME RELATIONS AND THEIR BEARING UPON HEAT DELIVERY

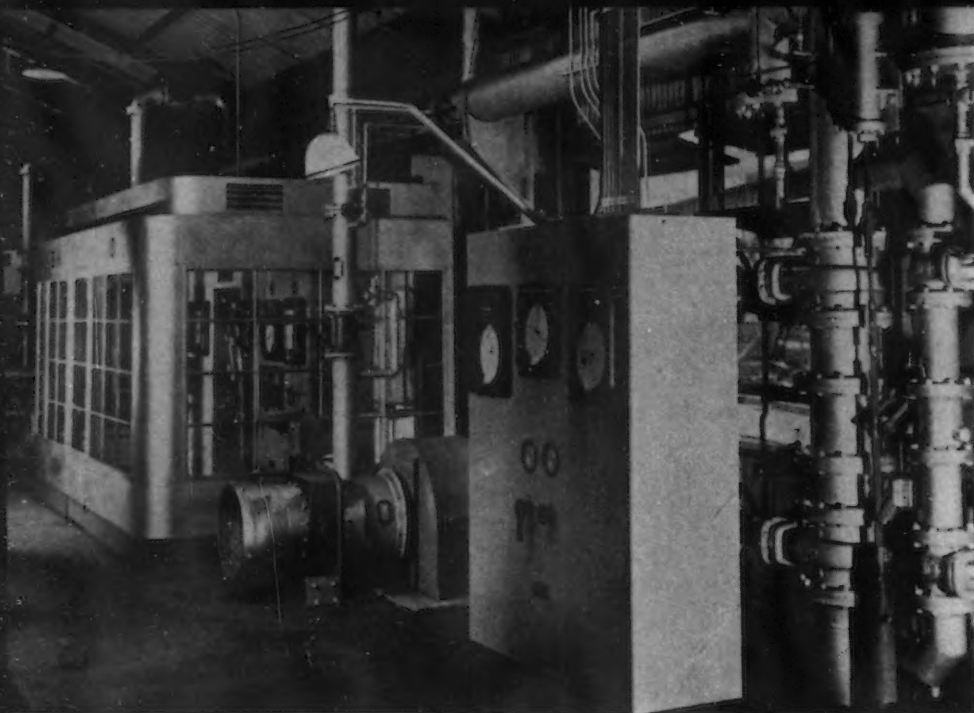
By use of the necessary actual combustion data, the same work shown on the preceding two charts can be carried out for any other fuel gases
Following is a summary, giving the true basis of comparison between various common gases, from standpoint of heat (B.t.u.) available at low temperatures, including the examples just shown graphically.
Each square represents one cubic foot of theoretical combustion products:-

Blue Gas	Water Gas	Butane	Coal or Oven Gas
Combustion Products 100.9 B.t.u. per Cu.ft. Net	Combustion Products 96.2 B.t.u. per Cu.ft. Net	Combustion Products 92.3 B.t.u. per Cu.ft. Net	Combustion Products 89.2 B.t.u. per Cu.ft. Net
Natural Gas	Anthracite Gas	Bituminous Producer Gas	Coke Producer Gas
Combustion Products 85.7 B.t.u. per Cu.ft. Net	Combustion Products 74.9 B.t.u. per Cu.ft. Net	Combustion Products 71.4 B.t.u. per Cu.ft. Net	Combustion Products 74.8 B.t.u. per Cu.ft. Net

Here are shown the relative heat values just given for the preceding squares:



These values deserve the attention so commonly paid to the gross B.t.u. values per cubic foot



THE 16 new soaking pits recently installed by the Amsler-Morton Co., Pittsburgh, at the Edgar Thomson Works of the Carnegie-Illinois Steel Corp. constitute a tangible factor in quality control from raw materials at the Edgar Thomson Works to finished steel at the giant new Irvin Works. The furnaces add an estimated 1,800,000 gross tons to the plant's annual heating capacity, and this capacity, together with provisions for future addition of heating units, minimize the possibility that soaking pits will become a physical "bottle-neck" in times of heavy production.

The pit and bloomer building, built to order "from the ground up," is well lighted and ventilated. The furnaces are of individual construction but located in rows of two on a rec-

tangular plan along the lean-to side of the building. The ingot car track and charging tracks are opposite and parallel to the lean-to.

Complete provision for safety of personnel and protection of equipment has been incorporated in this modern installation. Also, the space between adjacent furnaces permits venting for heat removal, and the strong draft of air passing upward and

between the heating units may be compared to the action of the stack on the gas flow in heating. And furthermore, practically all of the control equipment is located on the main deck level. The 16 furnace control panels are housed in eight steel-and-glass enclosures on the lean-to. The control houses protect the instruments from dirt, simplify their maintenance, and make them less accessible to unauthorized persons. As further protection for the sensitive regulating devices, a division in the floor deck supporting the control stations reduces the transmission of building vibration. Each panel individually controls one furnace. It includes, among other equipment, two temperature controllers, which regulate the combustion air supply; a combustion controller, which adjusts fuel-air ratio to changes in fuel gas composition; and a furnace pressure regulator, which operates the outlet damper. (See photo above.)

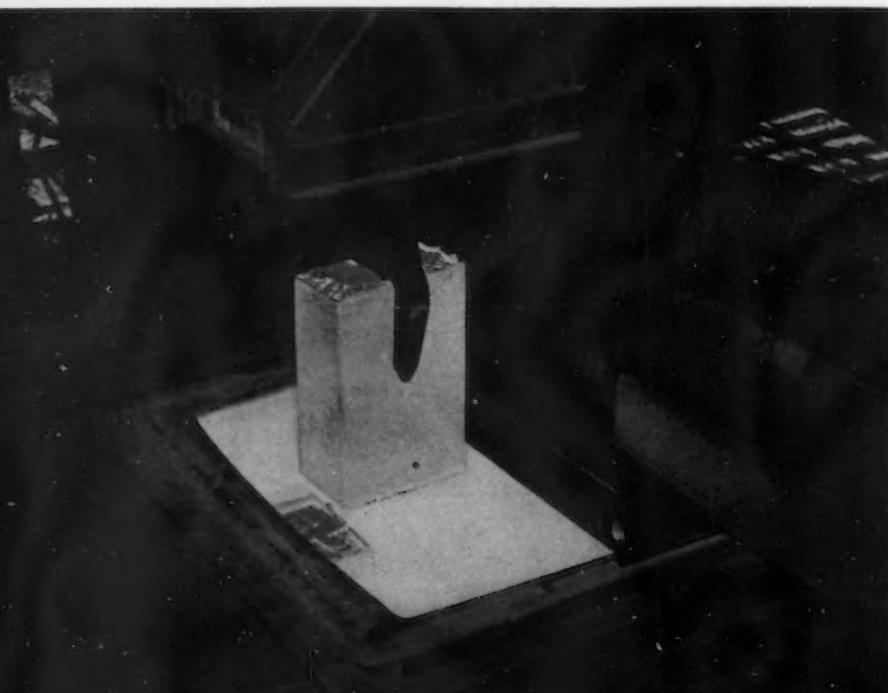
The photo on the opposite page, top, shows the entire pit furnace installation with double span cover carriages

... Edgar Thomson's

in place. The ingot car is being loaded with a heated ingot. The photo below shows a 14-ton ingot being withdrawn from a pit. Each pit is 15 x 16 ft. by 100 in. deep, with allowance on the bottom for 12 in. of coke. There are 64 recuperators, 6¾ ft. square by 85½ in. deep, in sets of two on each side. They are of the counter flow type, waste gas passing down, and air crisscrossing upward through baffles. Elements are octagonal refractory tubes 12 in. long with ½-in. walls.

Under the Amco system, the top or hottest part of the furnace is limited to a set maximum temperature and maintained until the bottom or initially coolest part attains its set temperature. Then, the control is transferred to the bottom as this zone reaches its set control point, and a thermal saturation meter shows when heat input merely balances radiation losses and the steel is "soaking."

The ratio of fuel to air is automatically corrected for variations in thermal value of the fuel by a B.t.u. correcting system. A central station density meter continuously samples



the gas and sends correcting impulses to a master regulator which controls the pressure in a header for all furnace combustion regulators. Special mechanisms correct the pens on the individual flow meters, which record individual furnace fuel input in B.t.u.'s; a master meter continuously records the B.t.u. value per cu. ft. of fuel; and a totalizing meter records total fuel input to all furnaces in cubic feet.

Other highspots in control equipment include two portable panel boards. These may be used for making a complete temperature and combustion test on any one pit when such a comprehensive check is desired.

Fuel is delivered through a 12-in. line extending along and outside the lean-to. Entering at a central point, this main divides into two 12-in. header lines, the gas supply for each furnace being taken from the header in a 6-in. line which runs through the lean-to floor and under the pit to the port. Air for combustion is piped to each unit in an 18-in. line, split to

ple, prevent operating both hoists at the same time; separate traverse and hoist operations; restrict traverse to low speed when cover is hooked to

To illustrate, sections of the main charging deck are removable and the controls permit use of this facility for periodic inspection of the underside of the cover. Cover change or replacement is also simplified, and two spare covers are conveniently stored in a repair pit.

New features are incorporated in the method of bottom maintenance. Coke breeze placement is easily accomplished by means of a circular type bucket fitted with hopper bottom and dump gates. Dressings are at mid-week intervals, and are made in the same mechanical way. Bottom cleaning is at weekly intervals, or even less frequently, and involves merely scraping the bottom cinder across the hearth to each of four cleanout holes with a spade type slab tool manipulated by the charging crane.

Modern Soaking Pits

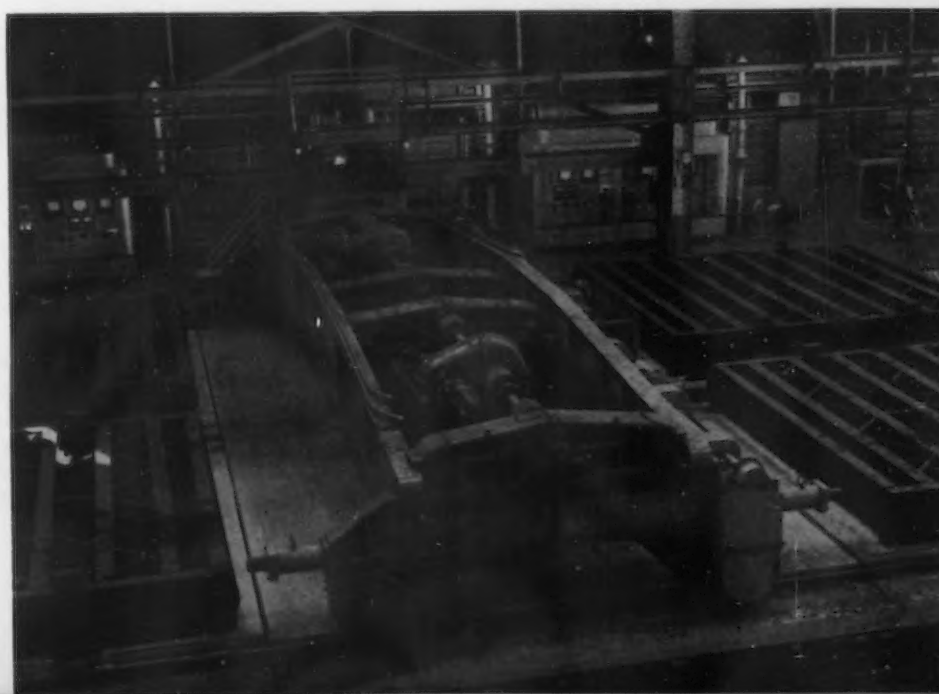
supply each of the four recuperators on each furnace.

A new method of cover opening is introduced by the double-span, cab-operated cover carriages. (Photo below.) Carriage and cover are separated, thus effecting a saving in capital investment. Three carriages in conjunction with three overhead charging cranes will service the full set of 16 furnaces. Each carriage is a rigid structural frame spanning the double row of furnaces, and is equipped with two fixed hoist and one traverse mechanisms. The cab is on the lean-to end (background of photo), and contains all controls, including foot brake and warning gong.

Covers are of the self-sealing type, with seal blades meshing into the granular trough. They are actually supported, however, by adjustable pads at four points on the steel binding. In hoisting the cover, lifting jaws on the carriage engage the four lugs on the cover frame shown in the picture.

The operations involved in cover removal are protected by precise controls and interlocks which, for exam-

carriage; and assure raising or lowering of cover only when carriage is centrally located over pit furnace. Some of these automatic limitations may be by-passed, however, by special push-button control to permit certain maintenance functions.





Pre-Cleaning

ABOVE

FIG. 1—Draining of parts requires efficient handling equipment, most of which may be utilized in connection with subsequent operations.

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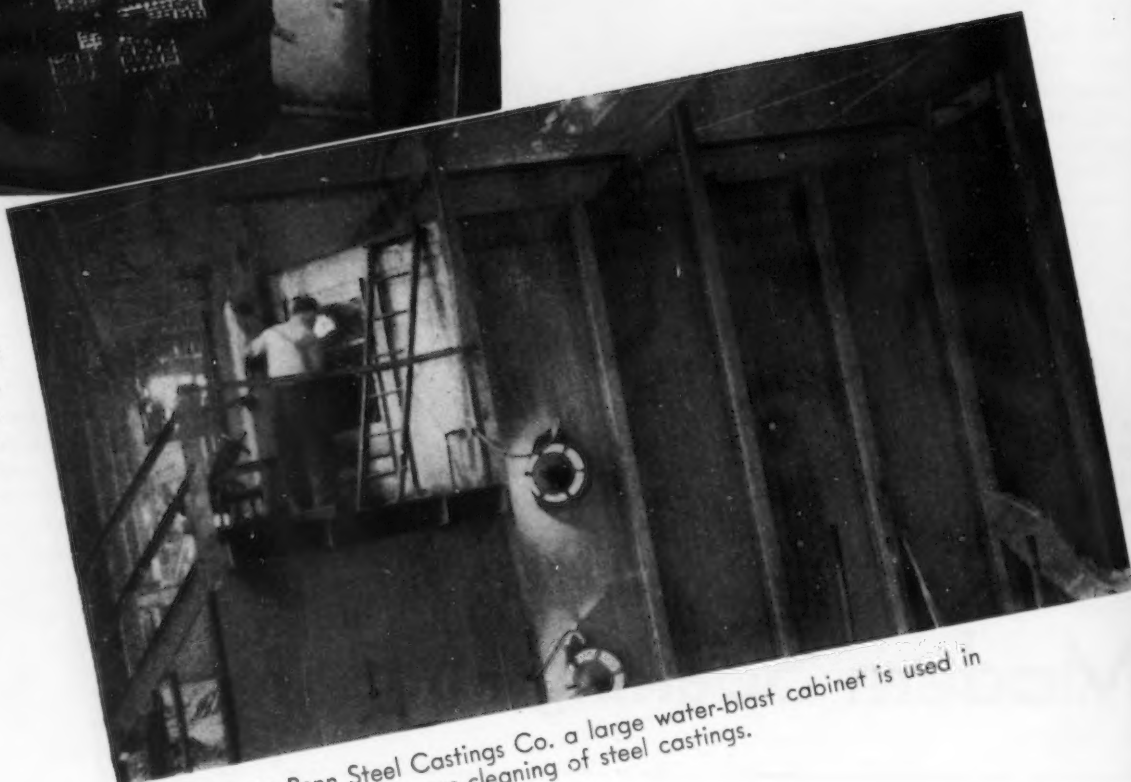


FIG. 2—At Penn Steel Castings Co. a large water-blast cabinet is used in the pre-cleaning of steel castings.

SURFACE appearance has become an important factor in the sale of every commodity. However, today this fact is given considerable emphasis when referring to objects made of metal. The least neglect in the cleaning of metal surfaces becomes quite prominent in the finished product, and increases tremendously the sales resistance. In brief, cleaning does not start after the final paint job is applied to the product, but has its beginning far down the line of manufacturing process involved in the product. A sand spot on a cast part may appear trivial to the mill room foreman, but the resulting dull spot appearing on the otherwise glossy paint surface may result in a lost sale of the finished product. Therefore, cleaning of metal surfaces is today considered to be of equal importance with practically all other manufacturing operations.

Cleanliness of metal surfaces is a matter of degree, and pre-cleaning has

By C. C. HERMANN

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become of first importance in obtaining a high degree of cleanliness with a minimum expenditure of labor and capital investment for equipment. Invariably, where complaints on the high cost of cleaning are heard, it is found that insufficient attention has been paid to the subject of pre-cleaning. It is therefore the purpose of this article to treat on the simpler preparations and functions used in industry to prepare metal parts for the more thorough cleaning operations to follow.

Much of the surface accumulation picked up by parts in the process of manufacture is from liquids containing dirt in suspension such as grinding compounds, coolants, dripping liquids, and quenching. A study of the size and shape of the part involved often reveals that a simple draining method

will free the part of the objection to a considerable extent. Many plants use floor racks, baskets, draining boards, and other equipment similar in construction for the purpose of draining. In the accompanying photograph, Fig. 1, is shown a basket utilized in the plant of the Lionel Corporation at Irvington, N. J. This basket is of steel construction, having a large number of perforations permitting the liquid to drain off the parts. A large number of these baskets are in use for this purpose and for dipping parts into a wash. In this particular instance 25 die-cast toy locomotive bodies are piled in a basket. The time required to fill the basket is approximately one minute and it is allowed to hang over the tank in which the drippings are caught for a period of six minutes. After draining, the basket is moved on a trolley track to the washing operation, involving a total of one minute 45 seconds for washing, rinsing, and drying. Due

of Metals . . .

SECOND in a Series of Articles on the Economic Aspects of Metal Cleaning and Finishing.

to the draining operation, the useful life of the washing solution is lengthened. No additional investment in equipment is incurred and practically no additional labor cost is involved, due to the draining operation.

Hydraulic Cleaning

An excellent example of hydraulic cleaning is found at the Penn Steel

the chamber, large doors are provided on one side and a slide-back door on the top. These doors are hydraulically operated. The water nozzles, of which there are two, $\frac{1}{2}$ in. in size, are located at one corner, one above the other. The upper nozzle is accessible by means of a stairway and platform. Safety glass windows are provided the operator at the blasting position and interior lighting is obtained by means

of six 500-watt vapor-proof flood lamps.

Water pressure is supplied by an Allis Chalmers three-stage pump, size X3, type ML3, having a capacity of 300 gal. per min. at 980 ft. head when operated at 3525 r.p.m. This pump is operated by a 150 hp. electric motor equipped with Clark control panel.

Water and sand are reclaimed by the use of a four compartment settling basin 15 ft. wide and 50 ft. long. The sand is carried into the first compartment of the settling basin by a sluice beneath the blasting table. The heavy sand settles out in this compartment and the water flows over a weir into the second compartment. Additional settling is obtained in the remaining compartments, the water being clear enough to be pumped back to the nozzle from the fourth compartment. Sand is removed from the settling basin by a grab bucket and overhead crane. The sand is deposited in a circular pit where the liquid is drained from it into the first compartment of the settling basin. Following a 12-hr. draining period the sand is removed from this circular pit to a heap on the floor from where it is passed through an electric riddle and returned to the mullers where it is bonded and turned back into use as a facing sand.

Mr. Briner, foundry superintendent, stated that the equipment had been in use four years and that maintenance has been practically nil, being confined for the most part to the pump and the replacement of the nozzle about once in six months. He stated that it requires approximately 15



FIG. 3 — Pre-cleaning a huge steel cast coupling by grinding at Penn Steel Castings Co.

Castings Co., located at Chester, Pa. This foundry produces steel castings ranging in size from 200 pounds to 30 tons, an average being approximately 4000 pounds per casting. The cleaning equipment consists of a water-tight room 20 ft. square, in which a rotating table is located, and the castings to be cleaned are set on this table by means of an overhead crane. To facilitate handling of the work in and out of

FIG. 4 — Hand cleaning the rear frame for a ship at Penn Steel Castings Co. This casting weighs approximately 10 tons.



minutes to clean an average casting, the resulting job being equivalent to that performed by a man using two hours for hand cleaning.

Snagging

Snagging is essentially a pre-cleaning operation consisting of removal of fins, gates, and sprue from castings after they have been removed from the mold and following a cooling period. Tools used in snagging work consist of electric and air operated grinders, chipping tools and cutting torch. Examples of snagging as practised in the foundry of Penn Steel Castings Co. at Chester, Pa., are shown in the accompanying photographs. Of considerable importance in snagging work is the amount of labor applied. Good judgment on the part of the operatives is essential if costs are to be kept at a minimum. Selection of wheels to get the best results is also an important matter. In this plant several types of wheels are used such as the cone, cup and the 8 in. diameter by 1 in. face conventional wheel. Grade and grain of wheels are also important matters and for some time past Mr. Briner has been using Royalite No. 54A-1 which he claims gives him good results for his type of work. There is no practical way of making general recommendations as to wheel data, such specifications depending entirely on the class of work handled and the grinding equipment available.

Most of the grinding in this plant follows the washing and chipping operations. The chipping operation is carried on by the use of compressed air chipping hammers supplied with the usual variety of bits. In many instances projections are removed from the body of the casting by use of a cutting torch, however, this practice only applies to very large work.

Sand Blasting and Tumbling

The sand blast cabinet and tumbling barrel occupy a prominent position in pre-cleaning methods. Considerable foreign matter as well as rust, scale, and sand particles are efficiently removed by the judicious use of this type of equipment. For blast cleaning, sharp sand, grit or shot may be used with compressed air at from 80 to 100 lb. gage pressure. Various size nozzles are available, the size of the nozzle depending on the capacity required. The cabinet or inclosure in which the work is placed while blasting is conventional and requires little explanation. The cabinet may contain a revolving table on which the work may be placed and the nozzle may be hand operated from either within or without

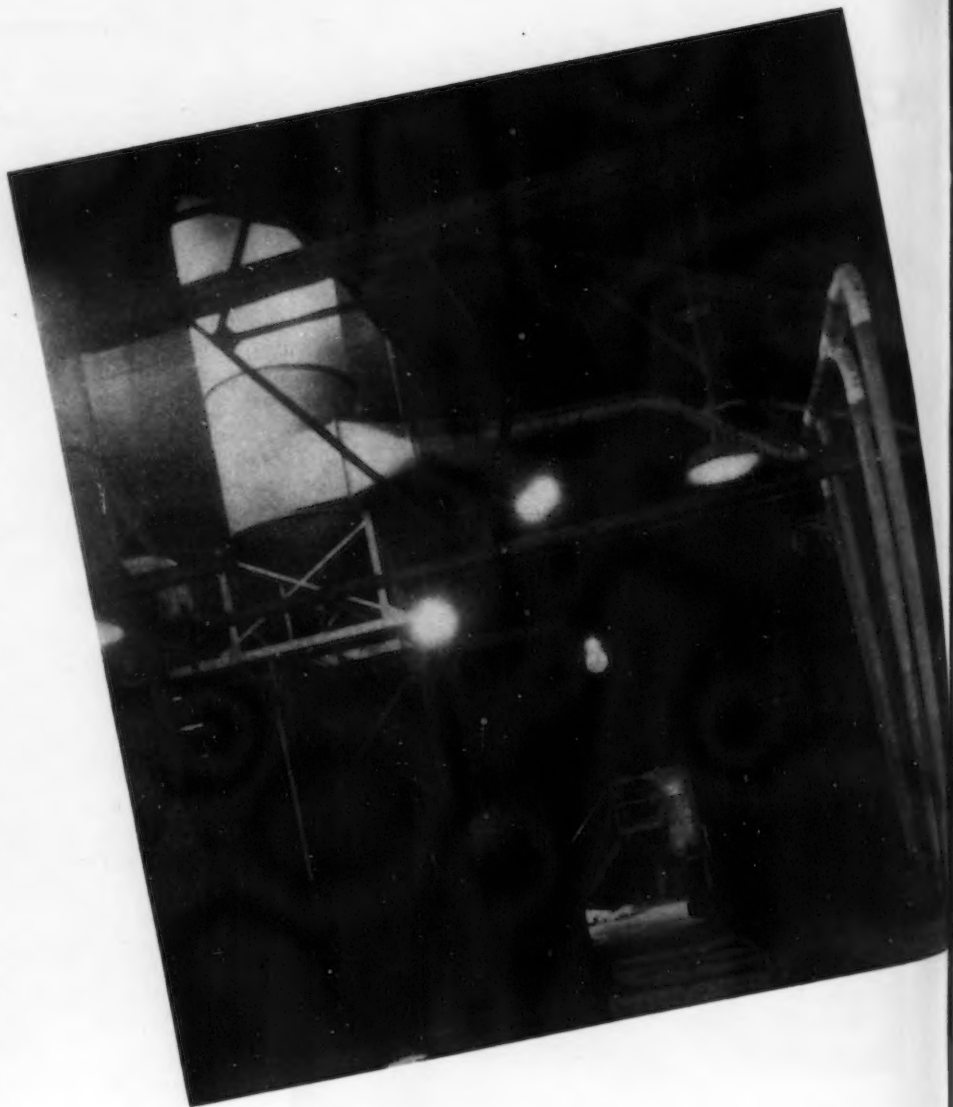
the cabinet. Mechanically operated nozzles are also used extensively. The blasting medium is generally reclaimed and returned by a mechanical conveyor to the supply hopper.

The time required for cleaning by this method depends on the physical characteristics and shape of the work and varies from a few seconds to several minutes. The rotating table has considerable merit for the cleaning of forgings, malleable and grey-iron castings, due to the fact that all surfaces of the parts may be subject to the blast quite readily by turning the parts on the exposed section of the table. The use of the sand blast barrel is advantageous for cleaning quantities of small parts.

The wheel blast as differentiated from the compressed air blast is a development of recent years. In this type of equipment the grit or shot is thrown with high velocity from the periphery of a rotating wheel eliminating the dependence on air compressure and reducing the cost of cleaning operations.

Tumbling the parts in the presence of stars, broken pieces of white iron and often using nothing more than pieces of wood, shavings or sawdust comprises the pre-cleaning operation. The method used depends entirely on the character of the matter adhering to the parts. For cast parts the tumbling is carried on with stars and other metal pieces. For light work, good results are obtained with from 15 to 30 minutes of tumbling whereas with large, heavy parts a longer period of time is necessary. For the absorption of oils or grease from the parts sawdust tumbling is used. With fresh sawdust the time required to absorb the grease is from 5 to 10 minutes. When the sawdust has become saturated it must be removed and fresh sawdust introduced.

Of considerable importance in blasting and milling operations, with the exception of the sawdust mill, is the dust removal system. Blasting equipment must be thoroughly ventilated to avoid a health hazard in the vicinity of the equipment. Dust must also be



removed from tumbling mills and exhausted to the outside atmosphere after freeing the exhausted air of the dust. The accompanying photograph, Fig. 5, shows a cleaning room utilizing mills and blasting equipment together with the exhaust system for removal of the dust produced.

Pre-Cleaning by Use of Solvents

A method of pre-cleaning by the use of solvents and vapors has found considerable favor in manufacture due to the low capital investment required as well as the low cost of labor. In this method the solvent, usually a chlorinated organic compound, is heated in a tank to the boiling temperature, usually 20 to 30 deg. below that of plain water, and the vapor resulting from the boiling liquid is allowed to condense in an adjacent tank from which it overflows back into the original tank. This is known as the closed cycle of degreasing. The oily parts

are subjected to contact with the vapor causing the vapors to condense on the lower temperature work, thus cleaning the work. In the accompanying photograph, Fig. 6, is shown the entrance to large equipment of this type and illustrates how the small metal stampings are hung on a conveyor which operates continuously through the cleaning chamber, in this instance proceeding a bonderizing application. The labor involved on this type of cleaning apparatus is very low comprising one operative to hang the parts on the hooks at the inlet of the machine and another to remove them at the exit. The conveyor is 5 ft. wide and from 6000 to 8000 pieces are cleaned daily.

Since there is no carry-over from the degreasing cycle, sufficient space has been allowed for thorough drying and evaporation of surface filaments. The solvent is replenished from time to time in the amount lost by evapora-

tion. These solvents being from four to five times as heavy as air, are readily retained within the confines of the machine. They are also inflammable, eliminating the possibility of a fire hazard.

Steam is sometimes used for pre-cleaning of work but is generally being replaced by more efficient cleaning methods. The heat recovery from the equipment is very low, accounting for its inefficiency. This method heats the grease and oil to the point where it will drain freely from the suspended work. The speed of removal is augmented by the velocity of the steam jet.

Scrubbing

Scrubbing as a cleaning method is a modification of hydraulic and solvent methods of cleaning. Under this method, force is applied to the scrubbing tool rather than the scrubbing liquid, the liquid being used to carry away the matter dislodged from the surface of the work. Various chemicals are added to the liquid to assist in dislodging the matter from the work, in some instances to the point of dissolving the objectionable matter. The labor cost of this method is too high to make it appealing to the average manufacturer so that it is relegated to such work as cannot be readily handled in other systems at hand.

A modification of this method of cleaning, and one that has considerable merit due to its low cost, is found in some non-ferrous metal foundries. The cast parts are removed from the mold while still at a relatively high temperature and immersed in a tank of water. The rapid expansion of the water adjacent to the hot surface of the work causes the sand to "pop" off and the work comes out of the bath relatively clean.

Centrifuging

Centrifuging is confined to relatively small metal parts such as produced on automatics, centerless grinders, and screw machines. A cutting compound or oil is invariably used on this class of equipment and a considerable portion adheres to the work. In the case of cutting oil, the value of the reclaimed oil justifies the practice, otherwise the degreasing operation would prove more profitable.

For centrifuging, the parts are placed in a basket which is then placed on a rotating spindle and revolved at a speed sufficient to cause the oil to leave the parts under the action of centrifugal force. The baskets of parts are rotated for a period of from 3 to 5 min.

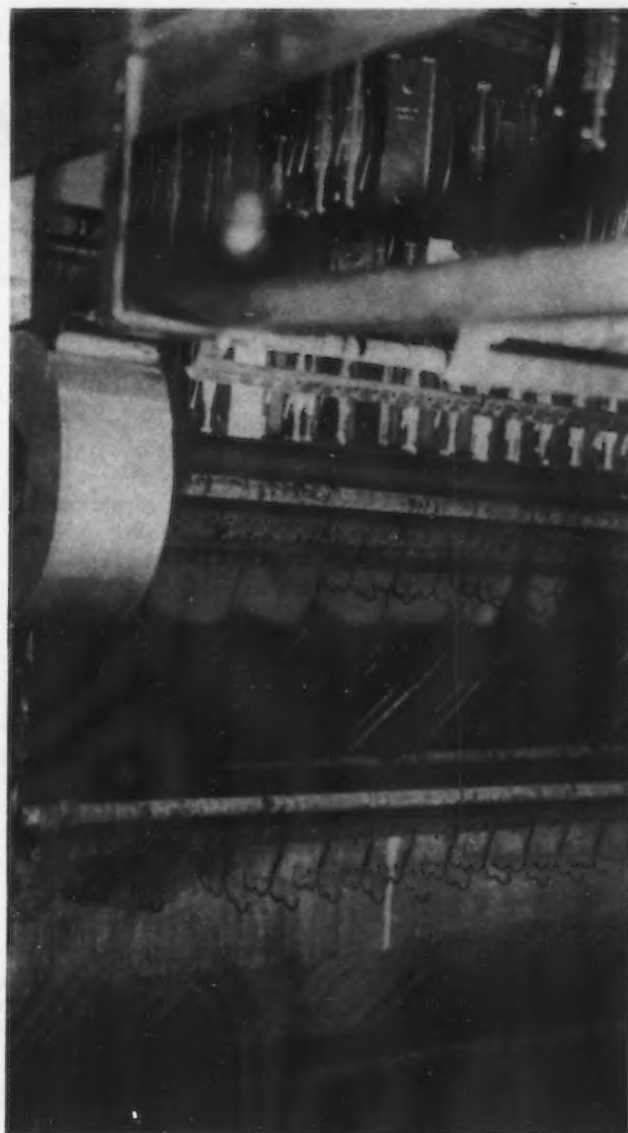
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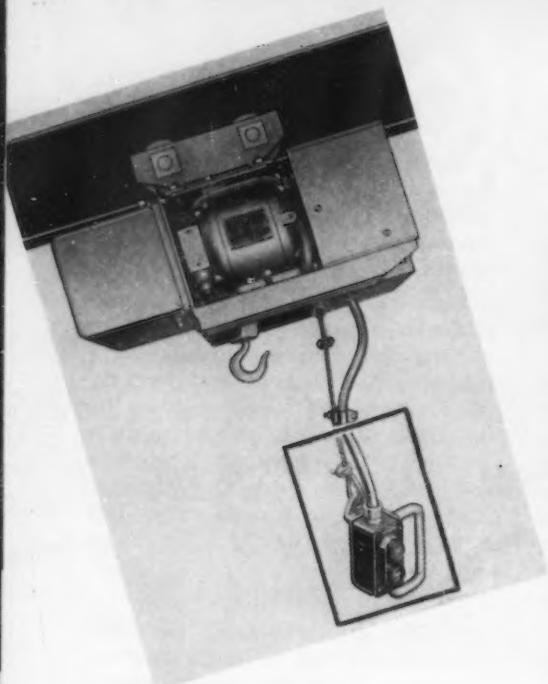
FIG. 5—A modern pre-cleaning department in the plant of Canton Malleable Iron Co. at Canton, Ohio. The dust exhaust system is also shown.

• • •

AT RIGHT

FIG. 6—Here steel blanks are shown entering the cleaning machine where they will be cleaned by passing through a solvent vapor.





ROBBINS & MYERS type F-1/2 Junior hoist is made in capacities of 350, 500, 750 and 1000 lb. at hoisting speeds from 70 to 30 f.p.m., respectively.

CUTLER-HAMMER'S new torque motor operated brake for a.c. service on hoists, cranes and elevators stops the cable drum with a cushion action that is positive and quick.



MADE in hoisting capacities from 250 to 750 lb. and speeds of 43 to 15 f.p.m., the Speedway is a light weight, low cost wire rope type hoist recently added to the line of the Wright Mfg. Division of the American Chain & Cable Co., Inc., York, Pa. Standard construction includes fully enclosed ball bearing motor, anti-friction bearings, cut alloy steel spur gears, multiple disk solenoid brake, push button control and pre-formed hoisting cable. Made in three types for lug suspension, hook suspension or mounted on trolley.

Recent Developments in Material

SEVERAL improved types of electric hoists have been introduced in recent months. A junior electric hoist, a new worm hoist and a new large electric hoist have been placed on the market by *Robbins & Myers, Inc.*, Springfield, Ohio. The type F-1/2 junior hoist is of steel construction and the trolley interlocks with the steel hoist frame. The hoisting mechanism is so constructed that the housing cover may be removed for inspection without disturbing the mechanism. The enclosed ball bearing, foot mounted motor is accessibly located on a shelf together with an oversize enclosed disk magnetic brake. Wiring and electrical controls are housed in a steel cabinet from which drops a pendent push button, reinforced by a steel cable or chain.

The drum is scored for full lift of cable and is placed parallel with the track so that low headroom is available. Headroom ranges from 16 in. to 24 in.

The *Robbins & Myers* worm hoist features the drum housed within the steel walls of the hoist frame, the same walls being extended so as to form an enclosed receptacle for all the elec-

trical apparatus. The enclosed magnetic brake, ball bearing motor, and the worm housing are readily accessible. The drum is parallel to the track. Worm is of heat-treated nickel steel and the worm gear is of chill cast bronze with hobbled teeth of 30-deg. pressure angle, approximately. Timken and double thrust ball bearings mount the unit within an oil-tight housing. These hoists provide capacities from 750 to 8000 lb. in a selection of speeds and lifts and are also available in twin hook hoists and winches.

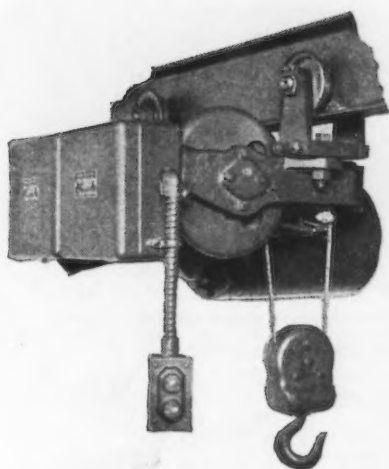
The new type F *Robbins & Myers* electric hoists employ the same power plants used successfully for many years, incorporated into all steel construction. The steel trolley interlocks with the steel frame. These hoists are available in capacities of 1000 to 15,000 lb. in plain and motor driven trolley types and a wide selection of speeds and lifts.

ANOTHER worm gear-drive type of cable hoist is the new two-speed a.c. hoists offered by *Electro Lift, Inc.*, 30 Church Street, New York. First step of the electrical con-

SEVERAL new types of electric cable hoists have been announced in recent weeks. Other lifting and transporting devices described in this review include a hydraulic elevating platform, hand lift trucks, renewable skid platform, drum and barrel truck, and improvements in belt and roller conveyors. Two new types of switch-

trol provides slow speeds for starting, inching, running and stopping and the second step gives fast speeds for efficient handling. Rope control or push button control is available. These hoists are built in capacities from 1/4 to 6 tons.

The squirrel cage motors are ball bearing mounted and are directly attached to the hoist frame, making a compact arrangement. Worm and worm wheel are mounted on Timken bearings, fully enclosed within the gear case. The entire load is carried on a rigid cast steel frame. Hook block is a safety type with a guard



THE new two-speed a.c. Electro Lift hoists give slow speeds for starting and inching and fast speeds for high lifts.

IN the type F Robbins & Myers electric hoists, the steel frame provides a shelf on which the enclosed ball bearing motor and magnetic disk brake are foot mounted in an accessible position. Rope drum is parallel to the track.



REPLACING ramps between different plant levels, for loading of trucks and freight cars or for the feeding of heavy materials into presses are the Levelator (shown) and Tabelator, made by the Rotary Lift Co., Memphis, Tenn. Oil hydraulic power supplied by a motor driven, seven-cylinder radial pump of the company's own design, is used for elevation of the platform, the travel of which is usually 5 ft. or less. When not in use, the platforms serve as a part of the floor, allowing ordinary traffic to be run over them. Air operation can also be used for certain applications. The picture shows an application to truck loading at the Memphis plant of the General Electric Supply Co.

Handling Apparatus

By FRANK J. OLIVER

Associate Editor, *The Iron Age*

ing locomotives are shown in use in steel mills. Several new types of magnetic separators for ore and the like have recently been built. Among auxiliary equipment are to be found a torque motor brake for cranes and hoists and a battery charging unit for industrial trucks.

that encloses the bottom sheave. The hoists are built in either single or twin hook types. Top and bottom limit switches may be provided to stop the load in each direction of travel, preventing the cable running off the drum.

Torque Brake for Hoists

WHERE positive, quick, cushioned braking is required for stopping or holding a load on a crane or hoist, *Cutler-Hammer, Inc.*, 258 North 12th Street, Milwaukee, has designed a new torque motor operated brake for a.c. service. Brake is re-

leased through a simple anti-friction ball jack driven by a torque motor, which is stalled across the line in the fully released position. When the circuit is opened, a heavy, helical torque spring sets the brake. A slight fly-wheel action of the rotor provides cushioned braking.

This brake is available in five sizes, providing maximum torque ratings of 160, 400, 800, 1600 and 3200 ft.-lb. on intermittent duty, with continuous ratings slightly lower. It is made in all commercial frequencies and voltages. Some of the detailed features are: large lining area for low unit pressures and long lining life; individual shoe adjustment to compensate for wear; adjustable torque; hardened manganese nickel steel wheel which retains its cylindrical form; and hardened steel pins and bushings.

New Chain Hoist Design

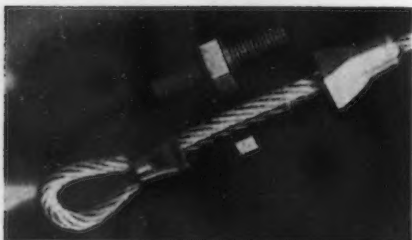
GRAVITY lowering, controlled by clutch and governors without the necessity of hand-over-hand chain operation, is one of the features of the new Power Master chain hoists recently announced by the *Coffing Hoist Co.*, Danville, Ill. The control

mechanism is positive in action and the load may be stopped within a fraction of an inch. Another time-saving feature is a free chain for quick up-or-down load chain adjustment for use when there is no load on the block. Other design innovations include lubri-sealed ball bearings and a planetary gear system sealed and running in oil. These units are equipped with special Diamond chain and are tested at twice the rated capacity.

Single-Stroke Lift Truck

A NEW lift truck which will raise capacity loads with a single stroke and requiring less than 70 lb. effort on the handle, has just been announced by the *Service Caster & Truck Co.*, Albion, Mich., and, Somerville (Boston), Mass. Complete handle-to-the-side lift permits operation of the handle from any spot within a horizontal arc of 180 deg. The truck is mechanical in lifting, hydraulic in lowering. For greater levelage, the handle is pivoted from the center of the front axle. The grip is non-blistering, turning with the hands.

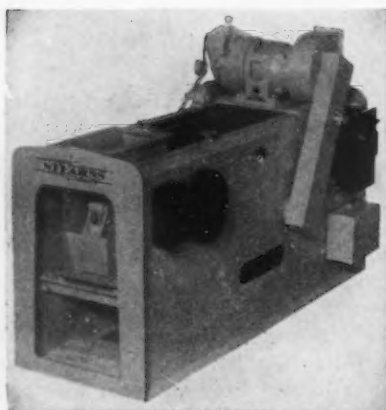
Wide-spaced, 10-in. wheels in front provide utmost stability and ease of



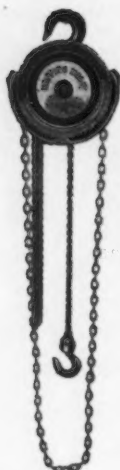
A NEW type of wire rope clamp, made of high tensile manganese bronze, is being manufactured by the Marine Specialty Co., 3178 Bellevue Avenue, Detroit. The clamp is made up of a split midsection with male threads tapered in such a way that when the two take-up nuts are tightened, the clamp has a firm grip on the wire throughout its length. The maker claims the clamp will hold the strength of a steel cable when properly assembled. Furnished in sizes from $\frac{1}{8}$ to 1 in. wire cable.



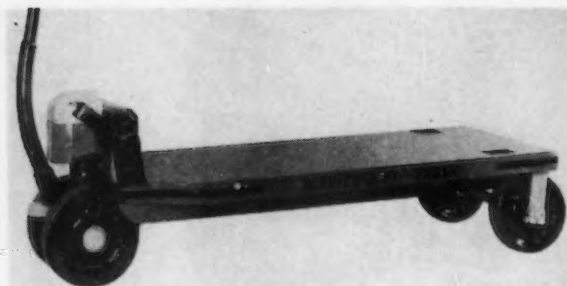
ONE of the largest magnetic separators ever built is this Stearns type KS 100-in. feed, five field, designed for the treatment of ore in a South American mining operation. The material is fed by an agitated reciprocating feeding element that distributes it in a uniform layer into the various separation fields. Rate of flow and also the point of contact of material with the premagnetizing poles is adjustable for maximum efficiency. Unit weighs 36,000 lb.



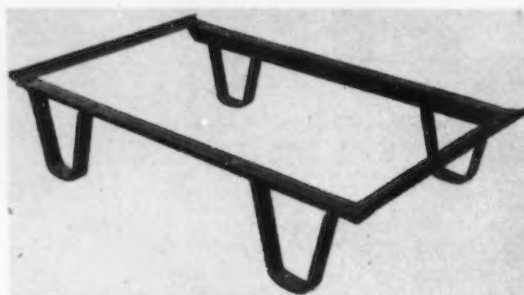
STEARNS improved type AM magnetic separator, used largely in the treatment of magnetite ore, roasted hematite, sponge iron, bronze powder and reclamation of fine iron, is now almost entirely enclosed in a modern welded steel housing. An additional feature is the vibrating feeder device that provides accurate control of material and affords uniform speed in desired thicknesses for most effective separation. Made by Stearns Magnetic Mfg. Co., Milwaukee.



THE Coffing Power Master controlled gravity lowering chain hoist is built in capacities ranging from 1 to 8 tons, with unit weights ranging from 86 to 169 lb., respectively.



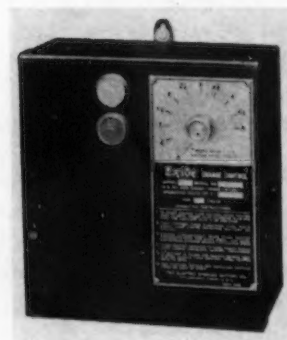
MECHANICAL lifting action in one stroke and hydraulic lowering is featured in this Service lift truck, made in capacities of 2000, 2500, 3500 and 5000 lb.



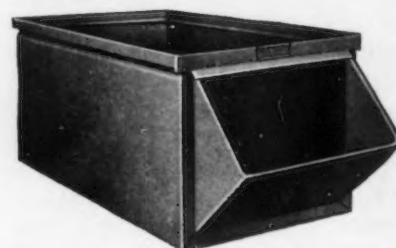
YALE Re Nu top skid platform frames can be had in almost any size and capacity required for their jobs. Clearances range from $6\frac{1}{2}$ to 12 in. The user supplies his own top boards which are held in place by upper side angles (not shown) and bolts.



THIS "Handy" drum and barrel truck is one of a number of special material handling devices recently announced by Smith Devices, 2245 North 12th Street, Philadelphia. Truck can be furnished with either pressed steel or solid rubber tired wheels, both with roller bearings. Structure is welded steel. Unit is made in two sizes, one for drums weighing up to 600 lb., the other for barrels weighing up to 1000 lb. It is claimed that even barrels of this weight can be up ended from the truck without undue effort.



A SELECTED time interval for continuing charging after the cell voltage rises rapidly near the end of the recharge is the principle of operation of this Exide model MP automatic charge control unit for industrial truck batteries.



TWO new types of stacking boxes have recently been added to the line of Pollard Bros. Mfg. Co., 5500 Northwest Highway, Chicago. The upper illustration shows a box with a stacking rim on all sides to prevent the box from unstacking or telescoping. Can be made in any size and in steel ranging from 22 to 16 gage. The open end box can also be supplied in the same range of gages and in a variety of sizes.

operation. The platform is covered with a steel plate and permits transportation of other than lift truck loads. All wheels are Hyatt roller bearing equipped and all links carry oilless bushings.

Automatic Battery Charging Unit

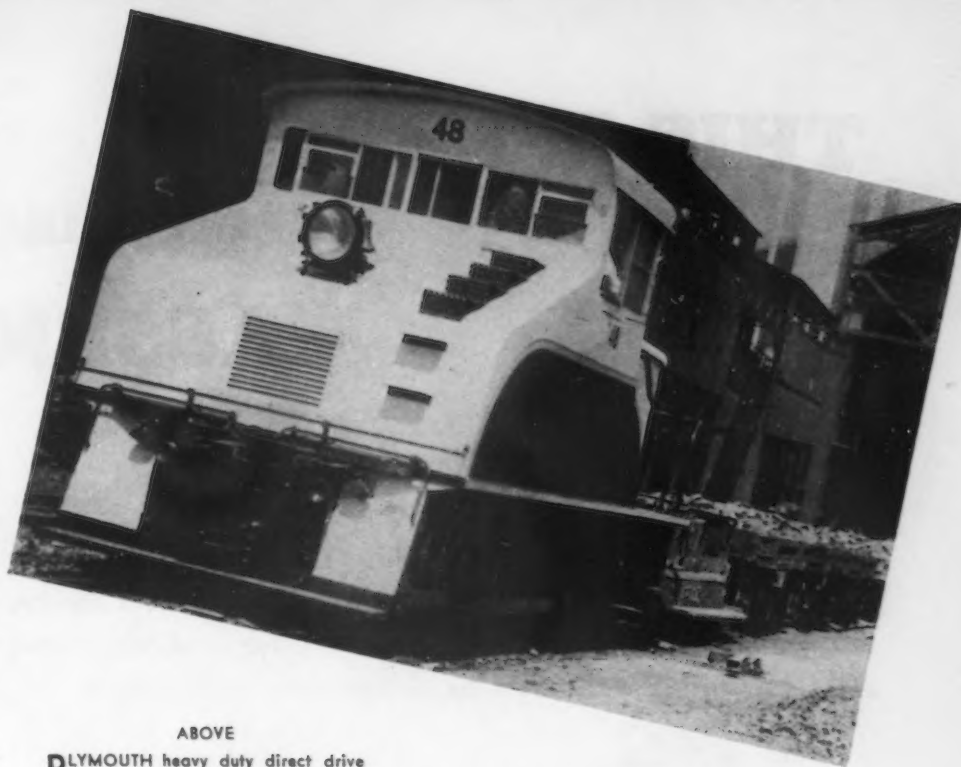
EXIDE charge control unit, model MP, is a new instrument recently introduced by the *Electric Storage Battery Co.*, of Philadelphia, for automatically controlling the recharging of storage batteries used in electric industrial trucks. Operation is based on the fact that as a battery approaches full charge, the cells begin to gas appreciably and the cell voltage rises. To detect this rise in voltage there is incorporated in the case an inverse-temperature-compensated voltage relay, and the time of charge to completion thereafter is regulated by a synchronous motor driven time switch. This has a selector knob which can be set in half hour intervals up to 5 hr. There are also two signal lamps: a white one, which indicates that the battery is on charge and a green one that indicates that the battery is completely recharged and the charging circuit cut off. Turning the time switch knob starts the cycle for a discharged battery.

Direct Drive Diesel Switcher

FOR the first time there has been made available in sizes from 45 to 70 tons in weight a direct drive heavy duty diesel switching locomotive, known as the Flexomotive, a product of the *Plymouth Locomotive Works, Division of the Fate-Root-Heath Co.*, Plymouth, Ohio. Low first cost as compared with the diesel-electric drive, safety with full visibility for one-man operation and low operating costs are inherent in this design. Fuel consumption is 3 gal. of oil per hr., and average maintenance cost, based on 7000 hr. of service, is around 20c. per hr.

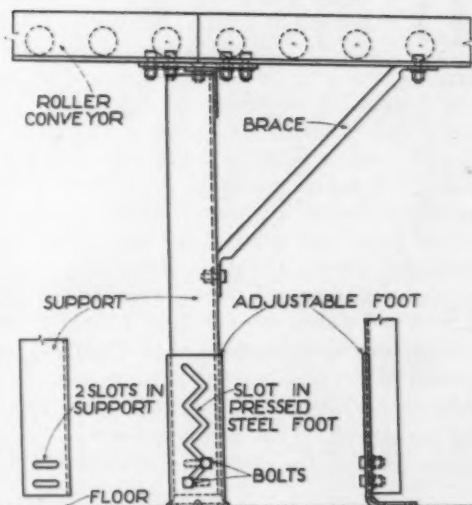
Drive is through a planetary type transmission, giving four speeds forward and reverse. Operation of the external and internal brakes of the two planetary drums are so timed that in only one speed do the internal brakes actually pick up the engine load. So far as the outside band is concerned, it has such great leverage through the planetary assembly that almost no slippage and consequently no wear takes place. Control of the brakes is by means of electro-pneumatic valves operated by remote control. The speed control lever and the reverse lever require little effort and

(CONCLUDED ON PAGE 67)



ABOVE

PLYMOUTH heavy duty direct drive diesel switcher shown in the yard of the Inland Steel Co. through whose assistance the published economy of operation was established.



BELOW

SHOWN serving a battery of open-hearth furnaces on the charging side is a 15-ton Heisler fireless locomotive built for the Wickwire-Spencer Steel Co. at Buffalo. The unit is charged with steam at 125 lb. pressure from the main powerplant.

AZIG-ZAG slot in the adjustable foot portion of this conveyor floor support is said to prevent slipping under heavy loads. Such a slot will hold the leg in position without the necessity of drawing up the nuts extremely tight and will maintain correct alignment for the carrying surface of the roller conveyor. This is a product of the Logan Co., Louisville.



THIS WEEK

ON THE

ASSEMBLY LINE

By W. F. SHERMAN
Detroit Editor

. . . Auto production passes low point, ready to start spring climb . . . UAW dispute causes Plymouth strike, cutting output by 2685 units for Chrysler . . . Low-priced steel still being delivered to automobile companies.

DETROIT—The curve of automobile production has probably touched bottom and should show continuous advances from now on. Automobile output during the past week was estimated at 75,660 passenger cars and trucks by Ward's Automotive Reports. According to this statistical authority, auto production would have held at a steady rate last week but for the UAW factional dispute at the Plymouth plant which disrupted that producer's schedule. Labor trouble, or rather inter-union warfare, caused output of Chrysler divisions to drop to 17,060 units from 19,745 the previous week. That accounted for a major part of the decrease from the

industry's total of 79,860 for the previous week. The rest of the decrease was attributed to a shutdown at Studebaker, which cut approximately 1500 units from the previous week's total. Other independent producers held steady; the Studebaker shutdown is linked by observers to the fact that this company will announce a new light car in a matter of a few weeks. Ford-Mercury-Zephyr volume held steady at 16,600 and General Motors output showed only a slight downward change from 34,860 to 34,765 for the week.

Analysis of recent automobile production shows a continued favorable comparison with a year ago, the cur-

rent level being 30 per cent above the 56,667 units produced in the same week in 1938.

March anticipated volume is 350,000 units, which would represent a 47 per cent gain over March, 1938, and would bring the total for the quarter to approximately 1,025,000 units.

Union Split Brings Battle

The labor trouble above referred to was the strike which closed the Plymouth plant while supporters of Homer Martin and R. J. Thomas battled for supremacy. It is a battle in which the tide seems to change from day to day, but it now appears that Homer Martin, who has lost a number of supporters recently, may eventually suffer defeat. However, predictions on this subject can go awry. A lot depends upon the amount of democracy which is permitted to prevail at the conventions which are to be held soon. Both Martin and Thomas are calling conventions. If the members at large get a chance to



PERSONNEL changes in high Chrysler posts have come thick and fast for weeks. Here TOM W. MOSS, right, is congratulated by FOREST H. AKERS, vice president and director of sales of the Dodge Division. Moss, who formerly was general service manager for the corporation, becomes director of Dodge Truck sales, succeeding J. D. BURKE, resigned. Shown at right is HARVEY J. NESTLE, appointed general service manager of the entire Chrysler Corp. to succeed Moss.





THE DESIGNER

"It's my job to save space
..keep down weight"



THE ENGINEER

"I've got to make it work!"



THE P. A.

"It's up to me to find the
best source of supply"



THE CUSTOMER

"I've got to use it...
will it satisfy?"

When all four agree the result is not always the cheapest part . . . nor the most expensive part . . . BUT THAT PART WHICH DOES BEST the things required of it.

BARNES-MADE SPRINGS are made with a sympathetic ear to the customer's problem . . . and an eye to his assembling costs.

You'll find BARNES-MADE PRODUCTS in chain-store merchandise . . . in Production Lines of automobile makers . . . refrigerator manufacturers . . . even in priceless laboratory equipment.

Knowing how GOOD to make it is just as important as knowing HOW to make it.

Next time and forever after "GET A BARNES QUOTATION"

Springs

The Wallace Barnes Company
DIVISION OF ASSOCIATED SPRING CORPORATION
BRISTOL, CONNECTICUT



SPRINGMAKERS FOR MORE THAN THREE QUARTERS OF A CENTURY

express their sentiments at either of these conventions, Martin may be able to pull a lot of votes. At a CIO-controlled convention his chances are not so good because he is certainly no longer in the good graces of John L. Lewis.

The union split has progressed so far that two versions of the weekly union paper are being published. In outward appearance they are the same. Titled *United Automobile Worker*, each bears the prominent line, "Affiliated with the Congress of Industrial Organizations." Martin's paper ballyhoos the UAW convention which will open March 4 in Detroit. The doors will be open to all, apparently, and Martin promises a referendum vote of the entire membership. The Thomas paper, calling itself the original CIO publication, claims that 280,341 UAW members have voted to support the UAW-CIO in a Cleveland convention March 27.

New Plant to Be Built

A number of new manufacturing plants or additions to existing plants in the automobile district are to be built soon. Topping the projected

activity for the vicinity of Detroit is a plant for manufacturing the new leaf spring type automobile seats. One of the two concerns interested is expected to make a decision within a few weeks. This plant must be built and equipped and must turn out automobile seats in volume probably by as early as mid-summer to meet demands for 1940 cars.

At Muskegon, Mich., recently it was indicated that Continental Motors Corp., aircraft division, probably would remove its remaining activities from Detroit to the city on the Lake Michigan shore. Continental, which now is making 90 per cent of the aircraft engines under 75 hp., has, in addition, a substantial volume of larger aircraft engines. The announcement, which came from Muskegon, revealed that Continental is developing an experimental 1000 hp. engine for use in army bombers to be manufactured by the Douglas Aircraft Corp. in California. The new engine is being designed for speeds of 400 miles an hour, or greater.

W. R. Angell, president of Continental, is reported to have said that the company is being considered for

a contract calling for delivery of a quantity of these motors next October. Muskegon officials have been quoted as saying that if the rearmament program is approved, the concern is in line for \$2,500,000 to \$5,000,000 in orders from the War Department for engines. *The Michigan Manufacturer and Financial Record* in an analysis of possible benefits to Detroit concerns, included in its list the Bohn Aluminum & Brass Corp. (pistons, bearings, bushings and other aluminum and magnesium parts), Detroit Gasket & Mfg. Co., Allied Products Corp., Federal-Mogul Corp., Houdaille-Hershey Corp., McCord Radiator & Mfg. Corp., Michigan Steel Tube Co., Evans Products Corp., Hoover Ball Bearing Corp., Eaton Mfg. Co., Wolverine Tube Co., Excell-O Corp., Micromatic Hone Corp. and the Warner Aircraft Corp.

The Grand Rapids (Mich.) Fisher Body Stamping Division is being approximately doubled in size. The present building was erected and opened late in 1936. It has about 400,000 sq. ft. of floor space. The expansion is expected to cost \$1,000,000 with equipment.

Steel Buying Small, But Deliveries Are Large

There has been questioning lately about the fact that the automobile industry has not done any heavy buying to cover steel requirements, and the recent flattening out in steel production has some times been partly attributed to this fact, a conclusion that seems to be unwarranted.

Shop talk about the steel business in Detroit is sure to bring out the statement today that January and February have been relatively dull months. But, invariably, the reference has been to inquiries and orders, not deliveries. The conversations have given the incorrect impression that the automobile industry is not taking much steel. Actually, delivered tonnage has been keeping pace with production of cars.

Where is the steel coming from?

Steel buying last fall, when prices took a drop, was just as heavy and concentrated as the automobile people could make it. Steel companies generally declared then that buying was being limited to fourth quarter requirements, but they had no way of knowing that this would be true, except by refusing to deliver after Jan. 1 on any order placed while prices were low.

Each of the major automobile concerns, with production in the range

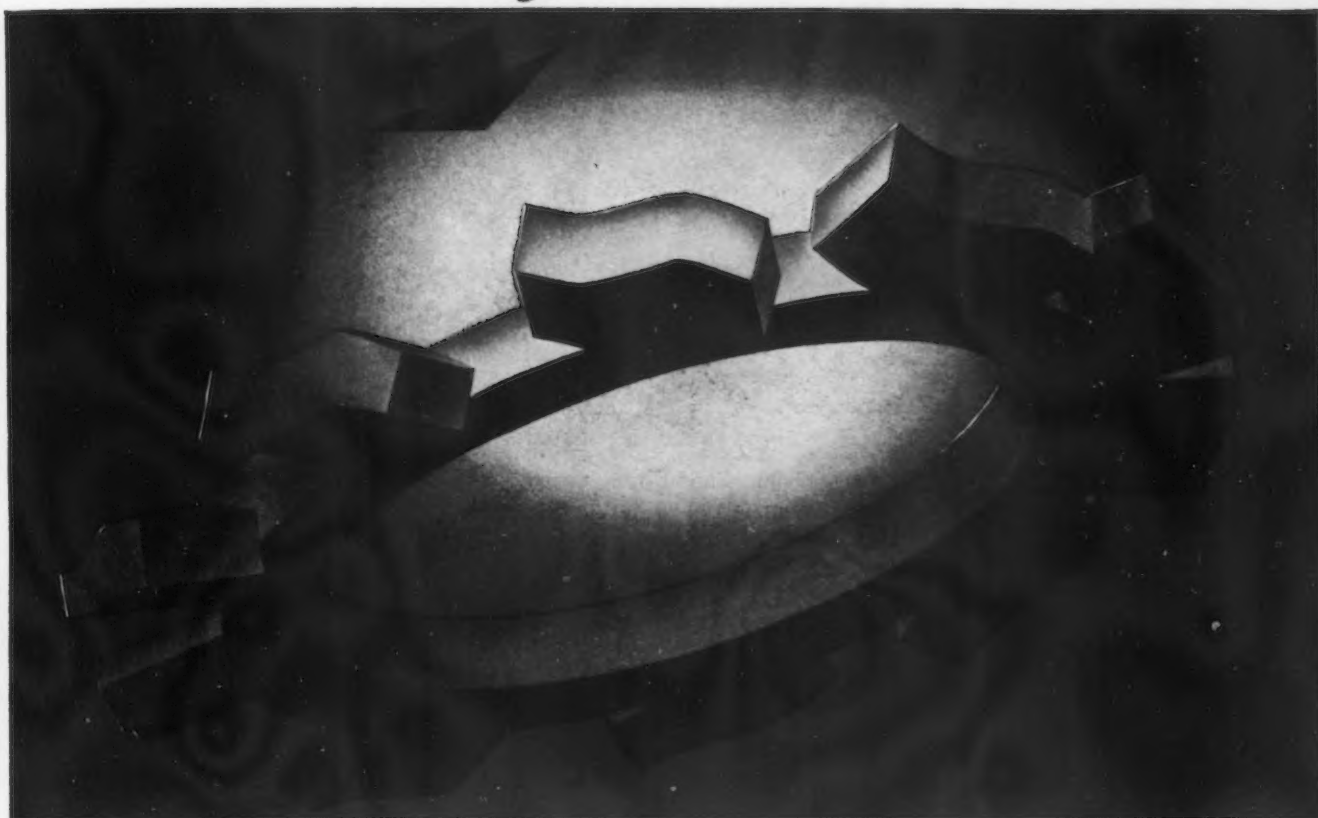
(CONCLUDED ON PAGE 70)

THE BULL OF THE WOODS

BY J. R. WILLIAMS



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THIS WEEK IN WASHINGTON

... New Deal, watching political trend, "comforts" business, but continues to spend and spend . . . Supreme Court declares sit-downs illegal, employers justified in dismissing such strikers . . . Court order blocks minimum steel rate temporarily . . . FTC ready with "new evidence" in latest government inquiry into steel.

By L. W. MOFFETT

Washington Editor, *The Iron Age*

WASHINGTON — Alarmed over the lag in recovery, and the strong political trend that has set in against itself, the Administration, in its newly-organized campaign to reassure business, has at least temporarily discarded "reform" and has suggested practical remedies which have long been urged by business. Yet, while the changed policy of the Administration has given tentative encouragement toward cooperation between business and the Government, at least one great necessary stimulant—a halt in Government spending—has not been offered.

Rather, the upward rise in the enormous national debt continues, throwing the budget still further out of balance. While Secretary of the Treasury Henry Morgenthau deplores the "what's the use" attitude of business, he officially tells Congress that this year's budget will necessitate increasing to \$50,000,000,000, the limit on the public debt. No move is made by the Administration to surrender wide "emergency" powers hastily given it by former rubber stamp Congresses. Nothing is promised in the way of reducing the gigantic, business-harassing bureaucracy, representing a civil payroll of 850,000 employees at a cost of about \$1,700,000,000 a year, to say nothing of the time and expense it heaps upon industry by way of ex-

cessive commands, rules, regulations, questionnaires and fishing expeditions.

Despite this omission, however, the changed tone of the Administration, if adhered to and put into practice, will in itself be a source of relief to industry. The promise of no additional taxes, given by the President, Secretary of the Treasury Morgenthau, and Secretary of Commerce Harry L. Hopkins, found responsive gratification, and it was heightened by reports that the Administration may consent to abandonment of the 2½ per cent undistributed profits tax.

At the same time doubt has been expressed that further taxes can be avoided so long as there is no check on the spending orgy, with an outgo of almost \$1.66 for every \$1 taken in. Mr. Hopkins at Des Moines, Iowa, in his maiden speech as Secretary of Commerce reflected the Administration's philosophy that "if new jobs are to be provided the national income must be increased, which in the minds of many, states the case backward since they maintain that private industry must be encouraged and jobs created before the income can be increased.

Contention is made that such encouragement can be definitely developed only after the spending spree is stopped and the Government releases its grip of extreme regulation over

and competition with private industry. The plea of Mr. Hopkins for a balanced budget, through an increased national income and jobs for the unemployed, like pleas made by the President, obviously was accepted as a sound objective but was criticized as being based on misconceived reasoning.

Harry For President

Mr. Hopkins' program in all respects is supposed to have the indorsement of the President. Probably the former WPA head and new Secretary of Commerce is closer to the Chief Executive than any other official in the Administration and reports have it that, if he does not run for reelection himself, the President wants Mr. Hopkins to be his successor. Whether correct or incorrect, it is a general view that Secretary Hopkins in making his public bow as head of the Commerce Department, was sounding sentiment toward himself as a Presidential possibility—apparently a dim possibility.

Setting his program on "a desire to create an environment in which private capital will be encouraged to invest," Mr. Hopkins frankly conceded that "among many business men there exists a widespread lack of confidence," or, as expressed by Mr. Morgenthau, a "what's the use attitude." To restore confidence and recovery, Secretary Hopkins presented several recommendations. Among them he proposed no "general rise" in Federal taxes and amendment of levies which "tend to freeze the necessary flow of capital"; breaking the "log-jam of private investment in the field of utilities, railroads and housing"; "tolerance and fairness in reaching just agreements with employers"; increased national income to provide jobs for the unemployed and a balanced budget; assistance for small business and a larger share of the national income for the farmer.

"Dear Bill" Letter Sent

In dealing with the labor problem, Mr. Hopkins did not propose any amendment to the Wagner Act or advance any suggested change in its administration but urged that the AFL



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and the CIO reconcile their differences. Significantly enough, on the day following Mr. Hopkins' speech, identical letters from President Roosevelt, who is at sea watching naval maneuvers, were received by President Green of the AFL and President Lewis of the CIO, urging "Dear Bill" and "Dear John" to agree to the setting up of a committee to compose peace between the two labor organizations.

Recognition that the greatest area for reemployment lies in the durable goods industries was seen in Mr. Hopkins' plea for breaking the log jams in the investment field of utilities, railroads and housing.

Private Investment Needed

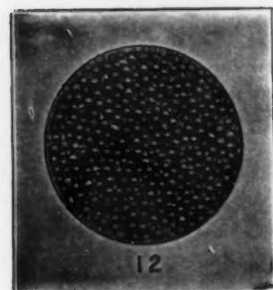
"It is clear to me that a returning increase in production cannot be accomplished without a substantial increase in private investment," Secretary Hopkins said. "I have tried to indicate . . . that the Government is desirous of doing everything it can to create an environment in which private investment is encouraged."

The thought of steel as being a most reliable barometer of business conditions was cast aside by Mr. Hopkins, who said that "today we have what is perhaps a better guide—the operations of the so-called small business men." He declared that one of his principal interests as Secretary of Commerce "will be to see that the resources of the Government are particularly directed toward aiding these small enterprises."

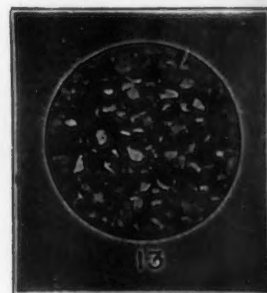
NLRB Orders Checkoff Fund Returned to Employees

WASHINGTON—The National Labor Relations Board has ordered Mt. Vernon Car Mfg. Co., Mt. Vernon, Ill., "to cease encouraging membership in and to withdraw exclusive recognition from Mt. Vernon Lodge No. 423, Brotherhood of Railway Carmen of America (AFL); to cease giving effect to its closed-shop contract with the Brotherhood; and to refund to each of its employees the sums deducted or checked off in behalf of the Brotherhood of United Car Builders of Mt. Vernon (independent)."

The board further ordered the company "to stop discouraging membership of its employees in Local Lodge No. 1756, Amalgamated Association of Iron, Steel and Tin Workers of North America (CIO) or in any other labor organization, and, upon request to bargain with the Amalga-



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mated, and to offer reinstatement and remedial wages to 76 men discharged, laid off, or demoted because of their union affiliation or activity."

The board also announced on Feb. 21 an election within 30 days among the hourly and piece-work employees of the International Harvester Co., Springfield, Ohio, to determine whether they desire to be represented by United Automobile Workers of America, Local 402 (CIO), or by Independent Automotive Association, Inc., of I.H.C. Employees, or by neither.

1940 Census May Include Housing

WASHINGTON — Among the dozens of proposals being considered by the Bureau of the Census as it prepares for the 1940 census of population is one which would direct the bureau to take a national inventory of housing to show the various Government housing agencies and the construction industry in what respect they can best direct their efforts in an attempt to revitalize the industry.

Overtures have been made to the bureau by a committee headed by Ernest M. Fisher, Federal Housing Administration economist, and consisting of representatives of other interested Government agencies, who are proceeding on the theory that an adequate inventory of houses is one of the missing links in the housing picture. The committee has held several meetings and has conferred with representatives of the construction industry before drawing up a tentative draft of questions to be asked.

The Census Bureau has indicated a desire to cooperate if there is sufficient interest manifested in the undertaking but is understood to have told members of the committee that they would have to accept the responsibility of getting Congressional approval of the census as well as an appropriation, which is expected to run in the neighborhood of \$13,000,000. If approval of the supplemental housing census is forthcoming from Congress, the bureau would take the housing count while enumerators are still in the field but after the population figures have been taken.

Inquiries to be answered would pertain to the number of houses, number of rooms, number of occupants, the extent to which mortgaged, the rate of obsolescence and other details. Members of the committee say that the tabulation, if taken, will be the first time a national inventory of houses has been attempted.

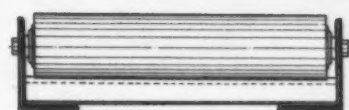
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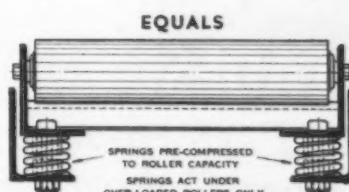
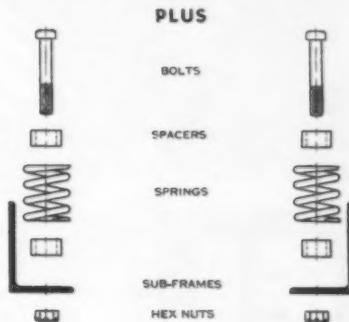
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Ask for Data Sheet 24-A & B. It contains complete engineering data. The book "Equipping Industry for Continuous Production" illustrates installations. Both items sent upon request.

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Attempt to Broaden Contracts Act Seen Hindering U.S. Arming

WASHINGTON—The Labor Department's move to broaden the Walsh-Healey Public Contracts Act, under which the Government lays down minimum labor standards to be met by firms doing Government business, is meeting some opposition by Congressional members who are reluctant to tighten the law at a time when they feel it should be relaxed in the interest of national defense.

Many of these members have not expressed themselves openly on the subject but they reflect the common viewpoint in War and Navy departments that making it more difficult for firms to sell supplies to the Government by tightening existing restrictions is far from being conducive to a systematic and efficient program of re-arming. Both War and Navy departments have gone on record as being against broadening of the Walsh-Healey law and it is recalled that these departments have protested against the move ever since the original Walsh-Healey bill was first introduced in the 74th Congress.

Threat To Defense

The latest evidence that some Congressional members consider the move to broaden the law somewhat of a threat to the national defense program is seen in the action of the Senate Military Affairs Committee which last week wrote into the national defense bill a provision excluding the proposed \$34,500,000 educational orders program from the jurisdiction of the Labor Department's Public Contracts Division. The department, zealous of its functions of requiring industry to adhere to its prescribed labor standards, immediately dispatched a lieutenant to Capitol Hill to protest against any move which would curtail its activities.

That the CIO is back of the move to kill the exemption of educational orders from the provisions of the Walsh-Healey Act was revealed Monday when CIO Chairman John L. Lewis was assured by Senate Majority Leader Barkley of administration support to strike out the proposed amendment. Senator Barkley also referred Mr. Lewis to Senator Elbert D. Thomas, Democrat of Utah, a member of the Military Affairs Committee and Chairman of the Committee on Education and Labor, who has announced opposition to the proposed exemption.

Carrying out the primary features of President Roosevelt's national defense recommendations, including a provision calling for 5000 combat planes, an authorization of \$23,750,000 for the defenses of the Panama Canal and \$34,500,000 for educational orders, the measure passed the House on Feb. 15 and was referred to the Senate Military Affairs Committee where members inserted the provision to which the Labor Department has taken vigorous exception. It was reported out favorably by the Senate Committee on Feb. 22.

The bill would authorize expenditures for "production studies, factory plans, and other production data and the storage and maintenance of gages, dies, jigs, tools, fixtures, and other special aids and appliances," but adds—and this is the insertion which would exempt companies receiving educational orders from the standards of the Public Contracts Act—that "for the purposes of this Act educational orders shall not be considered as contracts for public work or works or for the manufacture or furnishing of materials, supplies, articles, and equipment."

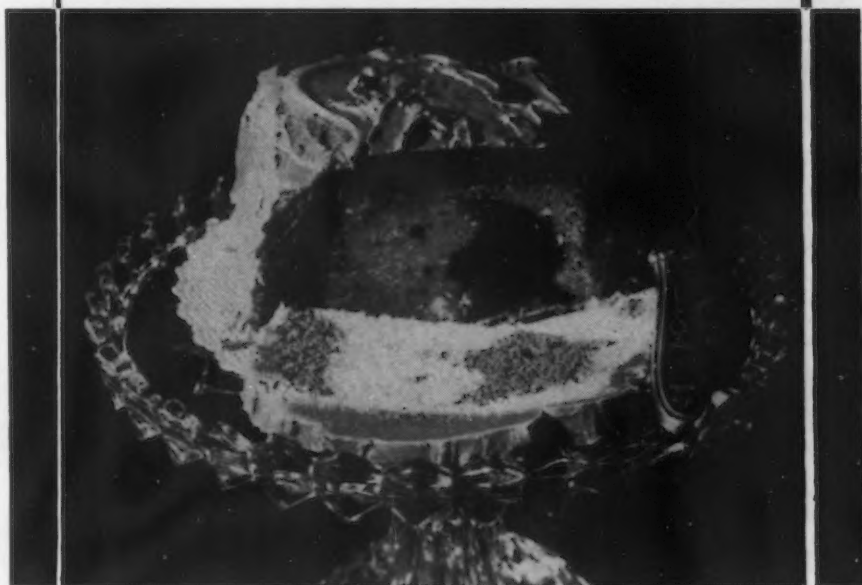
The \$34,500,000 would be authorized to be appropriated for use during the fiscal years 1939, 1940, and 1941.

The national defense move presumably is the only barrier standing in the way of bills introduced by Senator Walsh and Representative Healey, both Democrats of Massachusetts, which are designed to broaden the law along the lines suggested by the Labor Department. Except for the opposition prompted by the armament program, the measures are generally conceded to stand an excellent chance of passage.

CIO Blacklist Defeated

The move seeks to bring within the law's scope contracts of more than \$2,000 whereas the present limit is \$10,000. It would cover sub-contractors for the first time, would revise the penalty provision permitting employees to collect double the amount due them in case of a violation of the minimum wage standards, and would subject shipbuilders and sub-contractors receiving Maritime Commission work to the labor standards prescribed under the law.

A CIO-sponsored amendment to place persistent violators of the Wagner Act on a blacklist and denied Government business was proposed last session but "high pressure" lobbying tactics by John L. Lewis is generally credited with having defeated the proposal.



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We have assisted more than one manufacturer to turn his product from the sad, heavy cake category to the light, fluffy side and the greater demand that is certain to follow. **LANDIS TOOL COMPANY** in **WAYNESBORO, PENNSYLVANIA.**

285

I N V E S T I N L A N D I S

Congress Urged to Approve Strategic Materials Orders

WASHINGTON—The Thomas bill, providing for expenditures of \$100,000,000 over a four-year period for the procurement of so-called strategic and critical materials of which this country is deemed to have a deficiency, was reported to the Senate floor last week by the Mili-

tary Affairs Committee with the recommendation that it be passed by Congress.

Representing the views of the War Department, which through Secretary Woodring wrote to the committee that "our national independence is based in large part upon an accumulation of

stocks of strategic and critical commodities," the measure is similar to one written by Senator Thomas, chairman of a Military Affairs sub-committee, last session and one which was the subject of a public hearing last year when the sub-committee considered proposed scrap licensing legislation.

Domestic Ores Favored

The bill was revised several weeks ago, however, after Senators Miller, of Arkansas, Wheeler of Montana, Murray of Montana, Ashurst of Arizona, McCarran of Nevada, and George of Georgia, jointly introduced a measure patterned after the Thomas proposal but designed to "encourage, as far as possible, the further development of mineral resources within the United States" and to give preference to "ores and materials of domestic origin" in making purchases to build up the required reserve supply.

As rewritten by Senator Thomas and as reported to the Senate floor, the measure incorporated the suggested provision for encouraging the further development of domestic resources and stipulated that in making purchases under the law "a reasonable time (not to exceed one year) shall be allowed for production and delivery from domestic sources."

Several similar bills have been introduced on the House side and these came up for consideration at a public hearing last week at which representatives of the domestic manganese industry were scheduled to testify. After a brief morning session, however, the hearings were carried over to this week. Representative A. Willis Robertson, speaking on behalf of the manganese industry in Virginia, told Representative Andrew J. May, chairman of the House Military Affairs Committee, that he believed the interests of the manganese producers would be adequately safeguarded by a provision in the May bill which provides that procurement of materials from abroad would be resorted to only after it had been ascertained that adequate supplies could not be obtained from domestic sources.

25 Millions a Year

The Thomas bill would authorize the expenditure of \$25,000,000 a year in each of the fiscal years 1940, 1941, 1942 and 1943 for the procurement, transportation, maintenance, rotation and storage of materials and commodities. The Treasury Department's Procurement Division would be the Government's purchasing agent and the materials would be stored on army

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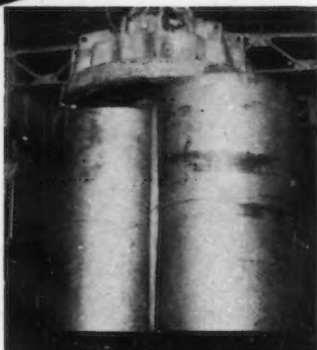
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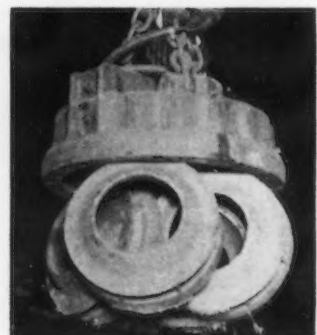
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and navy reservations. The Bureau of Mines would get \$350,000 and the Geological Survey, \$150,000, for each of the four fiscal years for research and for stimulating production of the commodities in this country.

The materials to be purchased would be specified by the Secretaries of War and Navy, acting jointly through the Army and Navy Munitions Board. A list already drawn up by the board appeared in the Senate Committee's report and named these commodities divided into three categories:

Strategic Materials—aluminum, antimony, chromium, manganese, ferro-grade; mica, nickel, optical glass, quartz crystal, quicksilver, rubber, silk, tin, tungsten and four other commodities;

Critical materials—asbestos, cadmium, cryolite, fluorspar, graphite, platinum, scientific glass, titanium, toluol, vanadium and 11 others;

Essential materials classified as neither strategic nor crucial—abrasives, acetic acid, acetone, alcohol (ethyle), chlorine, copper, copra, helium, iron and steel, lead, magnesium, methanol, molybdenum, nitrogen compounds (ammonia and nitric acid), petroleum, phosphates, potash, refractories, shellac, sulphuric acid (including sulphur and pyrites, uranium, zinc, zirconium and 15 other commodities).

Not Mentioned by Roosevelt

Since the proposed legislation has been listed by both War and Navy Departments as being an essential part of the armament program, President Roosevelt occasioned some surprise in his national defense message when he failed to mention the proposal. The Bureau of the Budget advised the Senate Committee last year that the projected legislation was not in accord with the program of the President. This session, however, the committee went ahead and reported on the measure without waiting for reports from six executive departments which are understood to have been delaying their replies pending further word from the Bureau of the Budget.

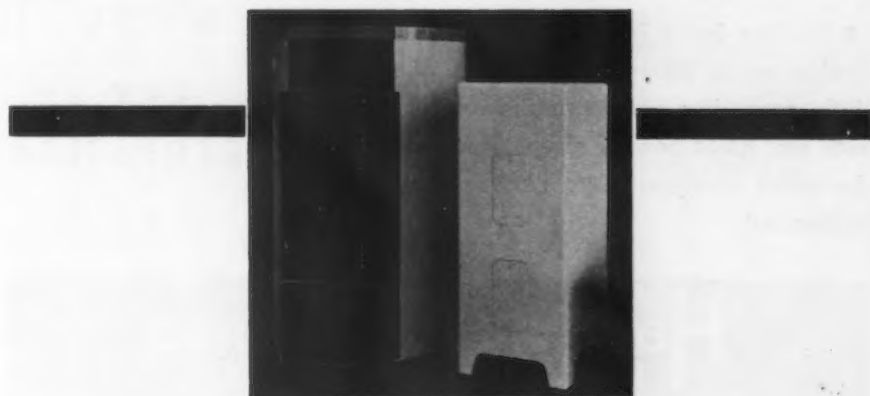
Chile Iron Ore Output Advances During 1938

WASHINGTON—Iron ore production in Chile reached the high level of 1,453,237 metric tons in the 11 months of 1938 as against 1,404,099 tons in 1937, according to reports to the Commerce Department.

FTC Ready With "New" Evidence In Latest Steel Investigation

WASHINGTON—To the Federal Trade Commission has been assigned what to it no doubt is the agreeable role of staging the prelude to another of unending Government "investigations" of the steel industry. It may or may not be significant that the commission takes the lead in presenting its case regard-

ing the industry before the Temporary National Economic Committee. As already denoted by the joint Department of Justice-Federal Trade Commission questionnaires, distribution, prices and the basing point system will be brought up again and perhaps gone into more thoroughly than ever before.



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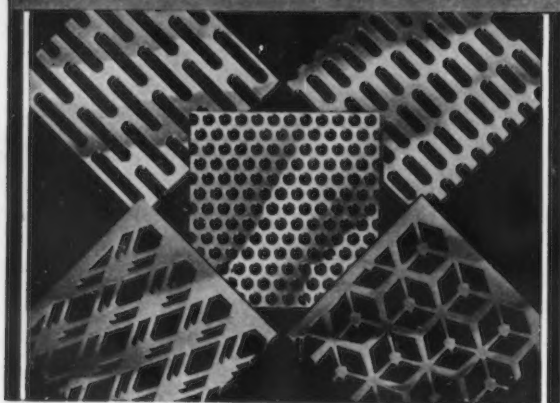
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The FTC started on Tuesday with presentation of its studies before the TNEC, opening with "basic considerations" of its program. It is expected that it will require a day or two, if not longer, to present the general case after which steel will be taken up, followed by farm machinery. Assigned to present the steel study are Attorney Eugene W. Burr, listed as the "Commission Steel Expert"; and Prof. Frank A. Fetter, assisted by Hugh E. White, Commission Economist, Attorney Walter B. Wooden, Chief Counsel William T. Kelley, and others of the FTC Staff, all of whom have attacked the basing point system. The farm machinery study will be presented by Col. William H. England, Assistant Chief Economist; Dr. J. W. Adams, Economist and others of the commission staff.

As for distribution of steel, this information once was gathered in a broad way by the commission in connection with its Pittsburgh-plus inquiry.

Precisely what may be the outcome of the steel investigation is only a matter of speculation. But if the commission should have its way—which is doubtful—the basing point system will be broken up. The commission unalterably opposed the system and just as unalterably favored the f.o.b. mill system. It has taken this position not only with respect to steel but as a fixed policy and has launched tirade after tirade against the basing point system and at present has a case involving that system under way against the cement industry.

Fitting in with its opposition to the delivered price system is the commission's assaults, upon Administration prompting, against identical bidding. Hence this latter subject promises to play an important part in the TNEC investigation and while the commission faces opposition at the hands of other Government sources against abrupt breaking up of the basing point system they share its hostility toward identical bidding.

Different Government departments in the past have attacked the practice. The latest and most conspicuous onslaught has just been made by the Department of Justice. Heretofore the Department of Justice's official position was that identical bidding was not necessarily prima facie evidence of a combination in restraint of trade. This was the view expressed by former Attorney General Cummings. Now, however, with the advent of Frank Murphy as head of the department it has, through Thurman Arnold, Assistant Attorney General, filed a suit under the Sherman law against 18

automobile tire manufacturers, seeking triple damages because of identical bidding. The complaint charges that such bidding, "whether or not supported by other evidence, creates a presumption of a combination to fix prices." The department has indicated clearly that if it wins the case it will, unless they stop the practice, institute similar proceedings against the many other industries which quote identical prices.

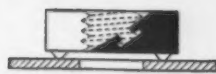
Inherently the basing point system produces identical bidding in the absence of price cuts or increases, though, as is conceded by important Government officials, the system definitely reflects competition. The emphasis placed by Government statements on bids being identical "to the last penny" is feigned surprise intended for public consumption. Officials are well aware that quoting the same base price plus the factor of freight produces identical bids just as surely as two plus two equals four.

However, the joining of the Department of Justice in the attack on identical bidding by the realistic process of a court suit is taken by some sources to mean that it will support the position of the Federal Trade Commission respecting the delivered price system. This would denote a change of position. But since a change of position has become a New Deal commonplace this would occasion no surprise.

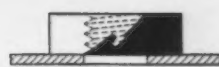
Not "Witch Hunt" Yet

As a part of big business, the steel industry, of course, has been an outstanding whipping boy for attacks at the hands of the Administration. Manifestly if a truce has been declared and actual cooperation between Government and business is effected, the result should be wholesome. If, for example, the TNEC inquiry is not to be a "witch hunt," and the country is being told it will not be, business will be given reassurance it does not yet have. In all fairness it may be said that so far the TNEC hearings, whatever their ultimate value, if any, have not taken on the character of a "witch hunt." In instances, notably in the case of hearings on insurance and the policy on patents in the automobile industry, the affected industries made such a showing as to improve their standing in public estimation. It may well be that a similar impression will result from the steel hearings. But because of its treatment at the hands of Washington there is concern lest the hearings develop plans for Government control of the industry and changes in its economic organization that will be highly disturbing. At the same time, there is less concern in this direction

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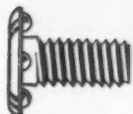


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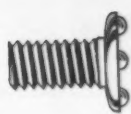


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Notes for next executive meeting

What about adequate plant protection

There has been trespassing and employees have been annoyed by tramps and peddlers

There has been pilfering of materials in the yard and the watchman reports prowlers at night



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than previously by reason of the fact that the New Deal no longer has a rubber stamp Congress. Instead it has on its hands a Congress which has definitely turned to its own thinking and is unwilling to accept ready-made Administration recommendations for all sorts of radical legislation.

Hence, whether the TNEC hearings do or do not develop legislation while the New Deal is still in power, it may be of a character different from that proposed by the Administration, which,

it is suspected, will press for further tightening of the anti-trust laws. Equally as distasteful to business, however, is Federal licensing legislation, which, in and out of season, is being urged by Senator O'Mahoney, chairman of the TNEC, and it is the common view that the hearings will be used by him as a build up for this legislation which would provide widespread control over industry. Prospects of such legislation at a future date obviously cannot be foretold.



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Government Steel Orders \$368,187

WASHINGTON — Government contracts for iron and steel products, as reported under the Walsh-Healey Public Contracts Act for the week ended Feb. 18, totaled \$368,187.62. Contracts for machinery reported during the same period amounted to \$334,653.55. Details of these and related contracts follow:

Iron and Steel Products

Columbia Steel Co., San Francisco, steel castings	\$10,800.12
The Colorado Fuel & Iron Corp., Denver, Colo., rail equipment ...	50,394.42
Graybar Electric Co., Inc., New York, tubing and fittings	28,948.56
Wheeling Corrugating Co., Detroit, metal pipe	11,572.93
American Car & Foundry Co., New York, cocks, plug	19,072.90
Truscon Steel Co., Chicago, reinforcement bars	11,341.00
Bethlehem Steel Co., San Francisco, reinforcing steel	119,780.80
Columbia Steel Co., San Francisco, reinforcing steel	23,592.00
Tennessee Coal, Iron & Railroad Co., Birmingham, reinforcing steel ...	18,619.76
Smith Corp., d/b/a General Iron & Steel Works, Portland, Ore., radial gates and hoists	17,834.00
Koppers Co., Bartlett Hayward Div., Baltimore, intake gate	19,800.00
Nicholson File Co., Providence, R. I., files	13,850.37
Graybar Electric Co., Inc., Denver, transmission line material	11,106.06
P. & M. Co., Chicago, rail equipment	11,474.70

Non-Ferrous Metals and Alloys

Charles Glass & Son, Baltimore, hospital alum. ware	Indefinite
The American Brass Co., Waterbury, Conn., sheets, copper-nickel alloy ..	\$24,074.42
Whitehead Metal Products Co., Inc., New York, metals	Indefinite

Machinery

The Cleveland Tractor Co., Cleveland, motor vehicle parts	Indefinite
Caterpillar Tractor Co., Peoria, Ill., tractors	\$39,489.60
Stewart Warner Corp., Chicago, engine parts	23,946.57
Levene Motor Co., Philadelphia, engine parts	49,288.15
Brown & Sharpe Mfg. Co., Providence, R. I., milling machines ..	32,474.18
Dierelt & Eisenhardt, Inc., Philadelphia, pipe expanding machines ..	20,500.00
The American Tool Works Co., Cincinnati, lathes	16,316.30
Northwest Engineering Co., Chicago, dragline excavators	43,245.00
Westinghouse Electric & Mfg. Co., Washington, elec. refrigerators...	Indefinite
Davey Compressor Co., Kent, Ohio, constr. mach. parts	Indefinite
R. G. LeTourneau, Inc., Peoria, Ill., constr. mach. parts	Indefinite
Pioneer Engineering Works, Inc., Minneapolis, constr. mach. parts ..	Indefinite
Bay City Shovels, Inc., Bay City, Mich., constr. mach. parts	Indefinite
Chicago Pneumatic Tool Co., New York, constr. mach. parts	Indefinite
Gar Wood Industries, Inc., Detroit, constr. mach. parts	Indefinite
Gruendler Crusher & Pulverizer Co., St. Louis, constr. mach. parts ...	Indefinite
Ingersoll-Rand Co., Washington, constr. mach. parts	Indefinite
Schramm, Inc., West Chester, Pa., constr. mach. parts	Indefinite
Allis-Chalmers Mfg. Co., Milwaukee, constr. mach. parts	Indefinite
Caterpillar Tractor Co., Peoria, Ill., constr. mach. parts	Indefinite
Iowa Mfg. Co., Cedar Rapids, Iowa, constr. mach. parts	Indefinite
Kay-Brunner Steel Products, Inc., Los Angeles, constr. mach. parts ..	Indefinite

LaPlant-Choate Mfg. Co., Inc., Cedar Rapids, Iowa, constr. mach. parts	Indefinite
Sullivan Machinery Co., New York, constr. mach. parts	Indefinite
Universal Crusher Co., Cedar Rap- ids, Iowa, constr. mach. parts ..	Indefinite
LaPlant-Choate Mfg. Co., Inc., Cedar Rapids, Iowa, angledozers.	11,160.00
Singer Sewing Machine Co., New York, sewing machines	41,410.60
Singer Sewing Machine Co., New York, sewing machines	26,296.85
Crane Co., Washington, valves	30,526.30

Recent Developments in Handling Apparatus

(CONCLUDED FROM PAGE 51)

the throttle for engine speed is mounted on the same controller, making one-hand operation possible.

The 45-ton Flexomotive is equipped with a Cooper-Bessemer model EN heavy duty diesel engine having 8 x 10½-in. cylinders and developing 340 hp. at the governed speed of 850 r.p.m.

Lubricates Oven Conveyor Chains

CONVEYOR chains operating in high temperature zones, such as in baking and enameling ovens, can now be more effectively lubricated as the result of the development by *Acheson Colloids Corp.* of a new form of colloidal graphite, so finely divided that it could be suspended in suitable volatile liquids. The liquid, kerosene in this case, merely evaporates, leaving a very thin deposit of fine colloidal graphite on the surface. Experience has shown that this film of graphite provides lasting and economical lubrication for the difficult-to-reach friction surfaces under high operating temperatures.

Rubber Conveyor Belt

Improved conveyor belt construction, embodying a feature designed to withstand unusually severe service conditions, has been announced by the *Mechanical Goods Division of United States Rubber Co.*, New York. A special weave breaker-strip fabric in a heavy layer of soft white gum is inserted next to the belt carcass as an integral part of the belt cover, and provides a shock absorbing cushion for the belt cover.

Because of its ability to absorb the shock of heavy impact, this new type of construction increases the effectiveness of the cover in resisting the gouging, snagging and other severe wear encountered in heavy service. Extra protection is also provided the belt carcass due to the ability of this white breaker-insert to cushion the blows of heavy material.

Steel Construction Manual Again Issued

The second printing of the 3rd edition of the Manual of Steel Construction has just been issued by the American Institute of Steel Construction, 101 Park Avenue, New York. This is the standard handbook for engineers and builders, and is the only all-inclusive and complete publication of its kind.

600 to Speak at Safety Exposition

CHICAGO—The 1939 National Safety Congress and Exposition will be held in Atlantic City, Oct. 16 to 20. This year there will be 130 sessions and 600 speakers at the congress, touching on every phase of safety — industrial, traffic, home, school and public. About 10,000 safety leaders are expected to attend.

MARCH 14-15-16-17-18

1939

MACHINE & TOOL PROGRESS EXHIBITION

CONVENTION HALL—DETROIT



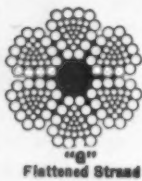
250 EXHIBITORS . . . Hundreds of new machines, tools, and items of production equipment . . . A.S.T.E. Convention program . . . Symposium on mechanical surface finishing . . . Technical papers on Hydraulic Units, Gages, Cutting Tools, Gear Tooth Finishing, etc. . . . Inspection Tours through Detroit's industrial plants . . . A week of major importance to everyone concerned with manufacturing . . . from Executive to Tool Designer . . . Make your plans **NOW**

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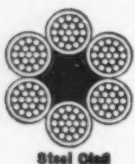
Style B
Flattened Strand



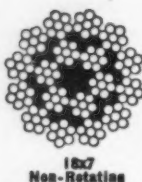
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Wire Rope Center



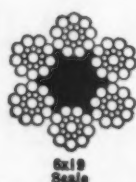
Steel Cored



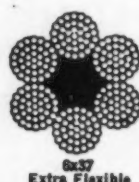
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Filler Wire



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6x37
Extra Flexible



8x19
Extra Flexible

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Modern Foundry for Canada's Cars

(CONCLUDED FROM PAGE 32)

and an oven with 14 sections of drawers from the old foundry. All are equipped with forced circulation gas burning heaters with the best of safety equipment.

After baking, the cores are cooled near the ovens and those not entering into assemblies are cleaned and placed on other racks for transporting to the foundry.

The cylinder block and head jacket cores are ground on a Milwaukee core grinder and passed down parallel assembly lines, finally coming together again in a vertical paste drying oven. From here, they are transferred to the core setting stations in the foundry.

In the pattern shop, located on the second floor, the wood and some of the metal patterns are made. Here are also cast the core plates and dryers. At the north end is the pattern storage department with about 6000 different patterns.

In the lower end of the core room, in line with the foundry exit, are the men's locker rooms and shower baths and across the assembly department is a rest room for the women.

On the second floor near the cupolas are separate metallurgical and physical laboratories. In the physical laboratory, the sand and castings are tested and the samples are prepared for chemical analyses. In the metallurgical laboratory, hourly analyses are made throughout the day. This laboratory has separate rooms for the photomicrographic work, the balances and the records. Next to the laboratory is a locker room and shower bath for the Melting crew.

24th A.S.T.E. Chapter Formed at Elmira

THE 24th chapter of the American Society of Tool Engineers was chartered at Elmira, N. Y., on Feb. 17, with 32 members. Elected chairman of the chapter was John R. Lynch, Ingersoll-Rand Co., Athens, Pa. J. B. Blank of Ingersoll-Rand, Painted Post, N. Y., was named vice-chairman; Howard Stratton of R. C. Neal Co., Elmira, was elected secretary, and J. R. O'Connell of Morrison Machinery Products in Elmira was elected treasurer.

688 Attend Annual Foundry Conference In Birmingham

WITH an official registration of 688, representing 17 states, the Birmingham district chapter of the American Foundrymen's Association held its seventh annual Foundry Practice Conference on Feb. 23, 24 and 25. The attendance was larger than for any previous meeting and is said to have broken all previous attendance records of the A.F.A. for conferences of similar type.

Donald D. Gillies, vice-president, Republic Steel Corp., was the guest speaker at the annual banquet on Friday night, with C. B. Saunders, president of the Birmingham district chapter, presiding and W. Carson Adams, of Adams, Rowe & Norman, Birmingham, serving as toastmaster. The other guest speaker was L. P. Robinson, Werner G. Smith Co., Cleveland.

Technical sessions were held on Thursday and Friday, with W. E. Curran, S. J. Price, R. C. Harrell, Dr. J. T. McKenzie, J. E. Reynolds and J. M. Franklin as chairmen. Karl Landgrebe, vice-president, Tennessee Coal, Iron & Railroad Co., was toastmaster of the luncheon on Thursday.

Papers Presented

Technical papers presented at the various sessions were:

"Blast Furnace Production of Foundry Pig Irons" by C. S. Lawson, general supt., Sloss-Sheffield Steel & Iron Co., Birmingham.

"Causes and Effects of Pin Holes in Stove Plate Castings" by D. B. Noland, factory manager, Gray & Dudley Co., Nashville, Tenn.

"Job Evaluation" by A. H. White, chief engineer, Stockham Pipe Fittings Co., Birmingham.

"Selection and Uses of Non-Ferrous Alloys" by John W. Kelln, Federated Metals Division, American Smelting & Refining Co., St. Louis.

"Foundry Facings and Mold Washes" by Edwin J. Klumb, chief chemist, Hill & Griffith Co., Cincinnati.

"Gates and Risers" by Pat Dwyer, engineering editor, *The Foundry*, Cleveland.

Friday morning and all of Saturday were devoted to plant visitations. Twenty-nine plants and supply houses were scheduled for visitations, and more than 300 delegates were handled. Plant visitation was in charge of R. L. Odgen.

The officers of the Birmingham chapter are: C. B. Saunders, chairman; R. C. Harrell, vice-chairman; W. O. McMahon, secretary-treasurer.



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DIVISION OF ASSOCIATED SPRING CORPORATION
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"They've been making quality springs for nearly one hundred years"



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It illustrates and describes various types of hoists—explains the construction characteristics and adaptability of each type—points out the advantages of the various kinds of controls available and contains considerable other interesting and instructive information.

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This Week on The Assembly Line

(CONCLUDED FROM PAGE 52)

of 1,000,000 cars for the year, bought steel for 500,000 or 600,000 units. Each one of these companies to date has assembled about 300,000 cars. They are still taking delivery on low-priced steel ordered last fall.

Asked about the statement made in September or October that all this low-priced material must be delivered

before the end of the fourth quarter, a steel man said:

"We all said it, but there was no way to hold anybody to it."

Arithmetic will show that each of these major companies probably has low-priced steel for 200,000 units yet. Not all of this is undelivered, on steel company books. Some substantial tonnages are on the floors of sheet metal shops in automobile plants awaiting fabrication. Some other tonnages have already been converted into parts

awaiting assembly. Steel buying now is not very far away. We would expect to see some inquiries blossom out after March 15. Buying for the last 60 days has been merely for fill-in requirement.

Prices Are Firm

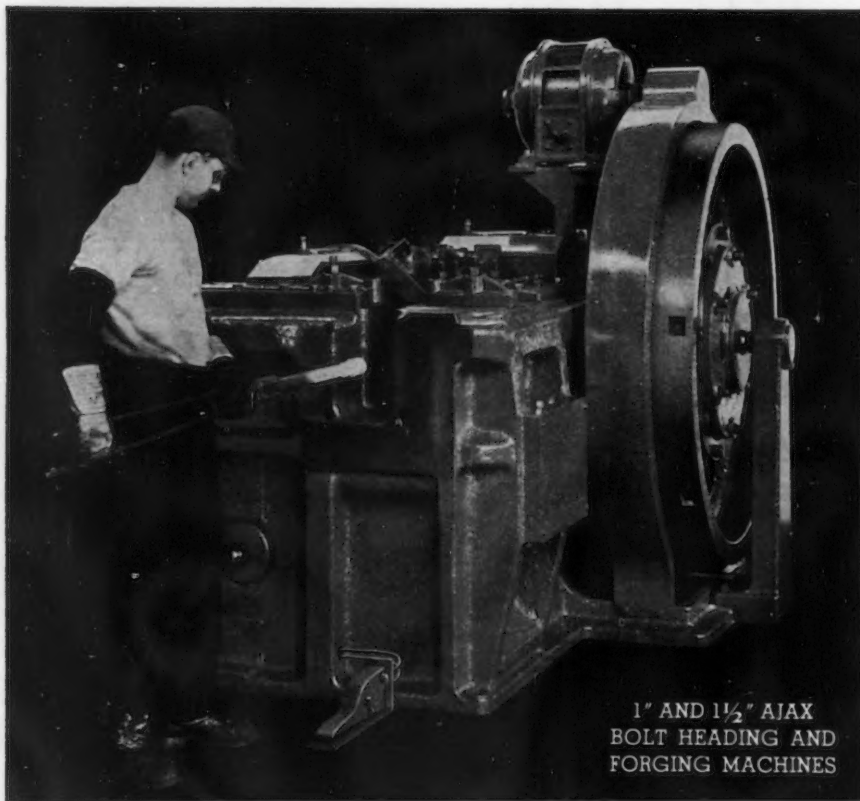
Prices today are regarded as firm, but those in the steel business and automobile business who are inclined to be frank don't think that it is at all irrelevant to predict that there will be price feelers put out in the next few weeks.

Inquiries on this subject brought from one local sales office the suggestion that sales managers far from Detroit needed a better conception of the conditions that have existed here since last fall—buyers throughout the Detroit area had covered their requirements substantially for fall and winter, even in the smaller companies. That is why it has been impossible to pick up even minor orders for months.

This condition is attributed to the Detroit "system" whereby the major companies notify suppliers that product prices must be adjusted downward in accordance with reduction in steel prices. Thus, when price concessions are made, telephones carry the word to virtually every purchasing agent in the area. In a short time the concessions are being made not only to the big purchasers, but to all of their suppliers and vendors as well.

It is important to note, however, that in the last few weeks "small accounts" in the Detroit area have displayed a great deal of buying activity, indicating a healthy underlying situation.

Weeks ago, in the Assembly Line, it was predicted that the earlier automobile shows and earlier introduction of new cars, possibly July 15, would shift the entire buying cycle backward three to six weeks. Developments since then have indicated that this prediction has a basis in fact.



1" AND 1½" AJAX
BOLT HEADING AND
FORGING MACHINES

With All the Advantages OF THE LARGE AJAX FORGING MACHINES

DIRECT ACTING
AIR CLUTCH
•
INTEGRAL BED
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EXTENSION
GUIDED SLIDES
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TOGGLE
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LUBRICATION

● For high production on bolts and similar straight upset forgings and extreme accuracy on intricate, thin walled, deep pierced forgings, these machines far surpass any of their type heretofore available to the production industry.

Air clutch driven and designed along the same lines as our large machines, they possess the same operating advantages. Write for our detailed descriptive bulletin No. 64.

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AJAX

Copperweld Steel Completes Expansion

PITTSBURGH—Copperweld Steel Co. has completed plant expansion and improvements authorized last year, including an additional building to provide facilities for the casting department, the installation of additional annealing and heat treating facilities, continuous wire drawing equipment, and the installation of stranding equipment.

Court Rules on Chicago's Licensing of Machine Shops

CHICAGO—In a test case involving the Ingersoll Steel & Disc Division of Borg-Warner Corp., the Illinois Supreme Court decided that a Chicago manufacturer who is operating a machine shop or repair shop incidental to his manufacturing operations and does no work for the public, cannot be assessed by the city under the ordinance licensing machine shops. Fees range from \$25 for a shop in which two persons are employed to \$500 where 100 work. Hundreds of Chicago manufacturing establishments are affected by this ruling.

The court said: "The business of conducting a machine shop has been a recognized commercial enterprise for many years. In conferring upon cities the power to regulate machine shops, the General Assembly must be held to have intended that this power would be exercised with respect to separate places of business known as machine shops, and not with respect to shops which are incidental to manufacturing establishments and do no work for the public."

In referring to Ingersoll, the decision read: "The manufacturing establishment involved in this case operated a factory in which it fabricated metal articles, stampings and forgings. In connection with this manufacturing operation, it maintained a tool room or machine shop containing lathes, planers, boring mills, grinding machines and other equipment in which it repaired its own machinery and made about half of the tools and dies used by it in its manufacturing processes."

World Tin Production Down Sharply in 1938

WORLD tin production in 1938 declined to 148,100 tons from 208,300 tons in 1937, a drop of 60,200 tons or 28.9 per cent, according to the International Tin Research and Development Council. Consumption in 1938 amounted to 151,600 tons, as compared with 198,700 in the preceding year, a decrease of 24 per cent.

The United States continues to be the largest individual consumer of tin, taking 50,723 tons in 1938. The United Kingdom, second largest, used 18,290 tons. Germany, Japan and Italy were the only major countries to show an increase in consumption

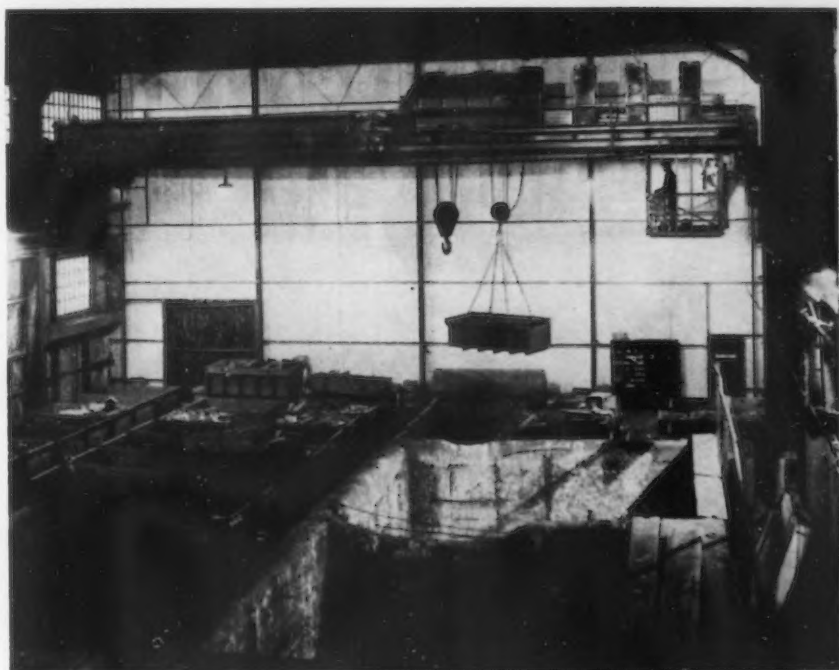
in the year, the gains being respectively 9, 34 and 29 per cent. Consumption in the United States in 1938 dropped 41 per cent, while in the United Kingdom it was down 30 per cent, and in the Soviet Union it was 36 per cent lower.

World tin plate output in 1938 totaled 2,975,000 tons as against

4,258,000 tons in 1937. In Spain, according to the council's report, tin plate production in the year rose to 35,369 tons from 8948 in 1937.

Steel Production Chart Published By Institute

THE American Iron and Steel Institute, 350 Fifth Avenue, New York, has published a large chart of steel ingot production for the years 1901-1938, inclusive. Copies may be obtained on request.



Tough Jobs Are Duck Soup For A Tiger Crane

Whether exposed to heat as in serving this annealing pit, or to any other severe conditions found in iron and steel plants, the Tiger crane is on the job every day, smoothly and quietly bearing its burden and helping management to meet production schedules on the dot. And it is all because the Tiger is designed and built to give maximum performance at the lowest possible operating cost. Like hundreds of other metal-working shops, you too can depend upon a Tiger for steady, low-cost, profitable overhead transportation.

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WHITING CORPORATION, 15601 Lathrop Ave., Harvey, Ill.



Automotive Engineering Congress To Move from Coast to Coast

A CONSECUTIVE program extending over a period of nearly three weeks is planned for the World Automotive Engineering Congress by its sponsor, the Society of Automotive Engineers. The tentative program shows that the congress will open in New York on May 22 for a

five-day session, will adjourn to Indianapolis for May 29 and 30, taking in the 500-mile international automobile sweepstakes, and will proceed to Detroit for a three-day series of automobile factory, laboratory, and proving ground inspections, May 31 to June 2. The congress will spend

June 3 in Chicago, where the entire Super Chief diesel streamlined train has been reserved for the trip to San Francisco, via Los Angeles. The congress will close with a three-day session in San Francisco.

Banquets will be held May 26 in New York, May 29 in Indianapolis, June 2 in Detroit, and June 8 in San Francisco. Among the speakers at these events will be Charles F. Kettering, vice-president, General Motors Corp.; D. G. Roos, vice-president and chief engineer, Willys-Overland Motors, Inc.; William S. Knudsen, president, General Motors Corp.; F. M. Zeder, vice-chairman, Chrysler Corp., and W. J. Davidson, president of the Society.

The technical and general sessions represent the most important gathering of authors and speakers ever brought together for discussion of automotive problems involving design, manufacture, and operation of automobiles, trucks, aircraft, tractors, buses and railcars. Fuels and lubricants are represented by outstanding authorities.

The congress has been planned by the meetings committee of the S.A.E., headed by Ralph M. Teetor, past president of the society, and vice-president in charge of engineering, Perfect Circle Co., Hagerstown, Ind., and the committee consisting of Dr. George W. Lewis, National Advisory Committee for Aeronautics; Paul G. Hoffman, president, Studebaker Corp.; O. E. Hunt, vice-president in charge of engineering, General Motors Corp.; and Mr. Zeder.



TRUE quality is embodied in a product only through uninterrupted maintenance of the highest manufacturing standards and practices over a long term of years. Continuously maintained quality requires experience, stability and a progressiveness that makes the best use of up-to-date plant and equipment, seeks out and applies the newest methods and materials, keeps both operating staff and management ever in step with the trend of the times.

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Alabama Scrap Dealers Organize

THE Alabama State Committee of the Institute of Scrap Iron and Steel, Inc., was organized in Birmingham on Feb. 23. Edwin C. Barring, executive secretary of the institute, attended. Max Kimmerling, of Birmingham, was named chairman; Robert Berman, Birmingham, vice-chairman; Thomas Knight, Birmingham, secretary-treasurer. Directors are: J. D. Wohl, Birmingham; M. Sabel, Montgomery; Mose Temerson, Tuscaloosa; A. E. Buckner, Anniston.

Metal Goods Corp., St. Louis, Robert E. Grote, president, has moved to 5201 Brown Avenue, where it has leased approximately 60,000 sq. ft. of floor space. Company is distributor for Aluminum Co. of America, American Brass Co., American Rolling Mills Co., National Brass Co., and M. & H. Zinc Co.

Society for Metals Sponsors Lectures

A SERIES of five educational lectures on "Physics of Solids," by Dr. Ernest F. Barker, University of Michigan, has been announced by the American Society for Metals, Detroit Chapter. All lectures will be in Detroit at the University of Detroit, Chemistry Building. The first lecture, on Monday, Feb. 27, dealt with "Metals in the Family of Elements." The other lectures to follow are "Some Optical Properties of Solids," March 6; "The Metallic Crystal," March 20; "Batteries and Magnets," March 28; "Radioactivity, Natural and Artificial," April 3.

Wisconsin Engineers Convention March 15-17

ENGINEERS' SOCIETY OF WISCONSIN will hold its annual convention at the Hotel Pfister in Milwaukee March 15-17. A feature of the first day's program will be a talk on the wage-hour law by Harold W. Story, vice-president and general counsel, Allis-Chalmers Mfg. Co., Milwaukee. On March 15, at 8 p. m., at a joint meeting of the Engineers' Society of Milwaukee and the Milwaukee Section, American Institute of Electric Engineers, C. J. Phillips, of Corning, N. Y., will give an illustrated lecture on "Recent Developments in Glass."

Workmen Among G-E's "Phi Beta Kappas"

GENERAL ELECTRIC CO. has granted factory workers with technicians of the engineering laboratories in selecting 18 "Phi Beta Kappas" of industrial progress for 1938. Four workmen in the factories and three factory foremen, whose inventive minds found ways to improve the products they worked on and to save thousands of dollars in manufacturing costs, were among those accorded the company's highest honor, the Charles A. Coffin award.

International Harvester to Modernize Milwaukee Plant

CHICAGO—The International Harvester Co. will spend about \$3,000,000 over a period of 18 months in modernizing and rearranging its Milwaukee plant. A complete rehabilitation of the foundry is called for to

equip it for specialization in the manufacture of large castings. Ventilation facilities and mechanical equipment will be improved. The expenditure also includes the laying out of considerable factory space preparatory to the manufacture of two new sizes of diesel engines.

The cream separator and milking machine manufacture will be moved from Milwaukee. Most of the press work on these two lines will be retained at Milwaukee, however.

Iowa University Offers Course in Cost Cutting

THE University of Iowa will offer a special 3-weeks' course from June 12 to June 30 for people from industry who want to obtain practical training in cost reduction methods. Plant layout, motion and time study, waste elimination and related subjects will be studied. An eight-weeks' course for college instructors and students will be held at the Iowa City school from June 12 to Aug. 4.

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THE inclinator step illustrated is of pressed steel $\frac{1}{8}$ " thick; $15'' \times 15\frac{1}{2}'' \times 3\frac{3}{8}''$ high. The welded end lugs provide the necessary strength, at less cost than is feasible by any other method.

This is typical of what Parish engineers are able to accomplish, by a skillful combination of stamping and welding, to provide better parts of improved appearance and lowered final cost.

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... THE NEWS IN BRIEF ...

Auto production passes low point, ready to start spring climb. UAW dispute causes Plymouth strike, cutting output by 2685 units for Chrysler. Low-priced steel being delivered to automobile companies.—Page 52.

New Deal, eyeing political trend, "comforts" business, lessens emphasis on reforms but continues to "spend and spend."—Page 56.

Labor Board orders Illinois concern to return checkoff funds to independent union members and to bargain collectively with CIO affiliate.—Page 58.

Census of population in 1940 will include national inventory of housing, if FHA plan is adopted.—Page 59.

Labor Department's move to broaden Public Contracts Act is considered hindrance to nation's defense plans by some Congressmen.—Page 60.

Senate Military Affairs Committee recommends \$100,000,000 purchase of strategic and critical materials for national defense in next four years.—Page 62.

Iron ore production in Chile 1,453,237 metric tons in first 11 months of 1938 against 1,404,099 tons in corresponding 1937 period.—Page 63.

Federal Trade Commission prepares "new" evidence to be used at opening of latest Government investigation of steel industry.—Page 63.

Government contracts for steel products during the latest reported week totaled \$368,187.—Page 66.

National Safety Congress and Exposition will be held Oct. 16-20, at Atlantic City.—Page 67.

American Institute of Steel Construction issues the second edition of the Manual of Steel.—Page 67.

24th Chapter of the American Society of Tool Engineers formed at Elmira.—Page 68.

688 attend annual foundry conference in Birmingham.—Page 69.

Copperweld Steel Co. completes plant expansion and improvements authorized in 1938.—Page 70.

The American Iron and Steel Institute publishes steel production chart.—Page 71.

Court rules Chicago manufacturers can't be assessed under ordinance licensing independent machine shops; hundreds affected.—Page 71.

World tin production in 1938 declines to 148,100 tons from 208,300 tons in 1937; U. S. consumption 50,723 tons.—Page 71.

Automotive Engineering Congress to move from Coast to Coast.—Page 72.

Alabama State Committee of Institute of Scrap Iron and Steel is organized at Birmingham.—Page 72.

Society for Metals sponsors lectures.—Page 73.

University of Iowa offers 3-week course in cost reduction to industrial managers, other employees.—Page 73.

International Harvester Co. will spend \$3,000,000 modernizing and rearranging its Milwaukee plant, will make two new diesel engines.—Page 73.

Factory workers rank with technicians in General Electric Co.'s selection of 1938 "Phi Beta Kappas."—Page 73.

Engineers Society of Wisconsin will hold its annual convention March 15-17, at Milwaukee.—Page 73.

Light welded steel frames may fill need for type of steel construction for one and two-story buildings, according to a report to the Engineering Foundation.—Page 79.

C. W. Heppenstall is awarded plaque in connection with his company's celebration of 50th anniversary.—Page 79.

Sit-downs illegal and NLRB can't force rehiring of such strikers, Supreme Court rules in 5-to-2 *Fansteel* decision.—Page 81.

Pittsburgh Steel Foundry Co. plans 15 per cent pay reduction for employees at its Glassport, Pa., plant.—Page 81B.

Exports of iron and steel products in January dropped to 134,788 tons from 166,404 tons in December.—Page 81C.

Temporary court order delays March 1 effective date of Labor Department's steel wage minimums.—Page 81C.

ICC report favors revisions of rail rates on manufactured products from South; no changes on iron and steel products.—Page 81C.

Labor peace "ultimately but not now" expected following President Roosevelt's letters to "Dear Bill" and "My Dear John."—Page 81D.

More than 450 tons of steel in new TVA generator.—Page 100.

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MEETINGS

March 14 to 18—American Society of Tool Engineers, Detroit.
April 7—Industrial Marketers of Cleveland, Cleveland.
April 26 to 29—Electrochemical Society, Columbus, Ohio.
May 15 to 18—American Foundrymen's Association, Cincinnati.
May 16 to 17—American Steel Warehouse Association, Chicago.
May 24 and 25—National Metal Trades Association, Chicago.
May 25—American Iron and Steel Institute, New York.
May 25 to June 1—Triple Convention (American Supply and Machinery Association, the National Supply and Machinery Distributors' Association and the Southern Supply and Machinery Distributors' Association), on board the S.S. <i>Monarch</i> of Bermuda.
Oct. 23 to 27—National Metal Congress, Chicago.



Ohio Ferro-Alloys Corporation
Canton, Ohio

... PIPE LINES ...

Aloco Oil Co., Midland, Tex., plans new 8-in. welded steel pipe line from oil field in Gaines and Yoakum Counties, Tex., to connection with main pipe line of Atlantic Pipe Line Co., in southwestern part of Gaines County, for crude oil transmission. Cost close to \$100,000 with pumping station and other operating facilities.

Humble Pipe Line Co., Humble Building, Houston, Tex., an interest of Humble Oil & Refining Co., same address, has approved plans for construction of new welded steel pipe line from recently developed Kelsey oil field area in Jim Hogg and Brooks Counties, Tex., to Benavides, Duval County, Tex., about 55

miles, for crude oil transmission. Connection will be made with company station and main pipe system at latter point. Cost about \$450,000 with booster stations.

United States Engineer Office, Louisville, closes bids March 10 for 20 sections each of 20 and 24-in. steel dredge discharge pipe.

Republic Pipe Line Co., Second National Bank Building, Houston, Tex., affiliated with Republic Oil Refining Co., same address, plans new 6-in. welded steel pipe line from East White Point oil field, San Patricio County, Tex., to Corpus Christi, Tex., crossing Nueces Bay, for crude oil transmission. Connection will be made with bulk terminal of company on ship channel at last noted place.

Bellevue, Idaho, plans about 16,500 ft. of pressure pipe for main water line from springs now being developed for new source to city storage reservoir; also about 7000 ft. of non-pressure pipe. Financing is being arranged. **Harold W. Merritt**, Twin Falls, Idaho, is consulting engineer.

Bureau of Reclamation, Denver, asks bids until March 10 for fabricated steel pipe for Grand Coulee dam, Grand Coulee, Wash.; also for valves, fittings and appurtenances (Specifications 830).

Northland Natural Gas Co., Evart, Mich., plans pipe lines at Reed City, Mich., for natural gas distribution, including main welded steel pipe line for bulk supply.

Quartermaster, Fort Moultrie, S. C., closes bids March 9 for galvanized steel pipe and fittings; also for pumping unit and one steam boiler (Circular 577-41).

... CANADA ...

... **Pig iron reduced \$3 a ton** ...
Tin plate off 25c. base box

TORONTO, Feb. 28—Prices are showing a softer trend. Pig iron has been reduced \$3 a ton on all grades and tin plate is 25c. per base box lower.

Steel interests are of the opinion that railroad contracts which will include rails, track supplies and rolling stock will be announced within the next couple of weeks. Jobbers are taking good quantities of steel but no large orders have developed from the automotive industry, makers of agricultural implements or radiator concerns. Steel interests expect business in the steel industry to reach its peak around the middle of April.

Production of pig iron in January totaled 57,660 gross tons against 53,381 tons in December, but February output may show a decline owing to the fact that the Steel Co. of Canada, blew out one furnace at Hamilton, leaving only four stacks in blast for the latter month.

Merchant pig iron sales continue in steady volume with melters adhering to hand-to-mouth buying.

Consumers of scrap are showing less interest in the market and while some dealers report good demand, others state that movement is slow. A local dealer states that his firm is piling scrap on the docks in preparation for shipment as soon as navigation opens and already a large supply has been piled at these points. Mills are taking steel scrap and demand is steady, while interest in iron grades is sustained. It is reported, however,

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that a number of the larger consumers are well supplied with scrap and have withdrawn from the market temporarily. Particularly is this true with regard to the National Iron Works, one or two other large foundry concerns, radiator makers and agricultural implement makers. It is understood that these companies again will be in the market in about a month's time. Scrap offerings also are increasing and local dealers state that better deliveries are being made into yards.

Andrews Steel to Improve Bar Mills

IMPROVEMENT of its billet and bar mills is planned by the Andrews Steel Co., Newport, Ky., during the next few months. Equipment for making small rounds and squares up to 4 in. for roll bars, forging purposes and crank shafts will be installed. Shears, hot saws, cranes and other new facilities are contemplated to bring the plant into broader production.



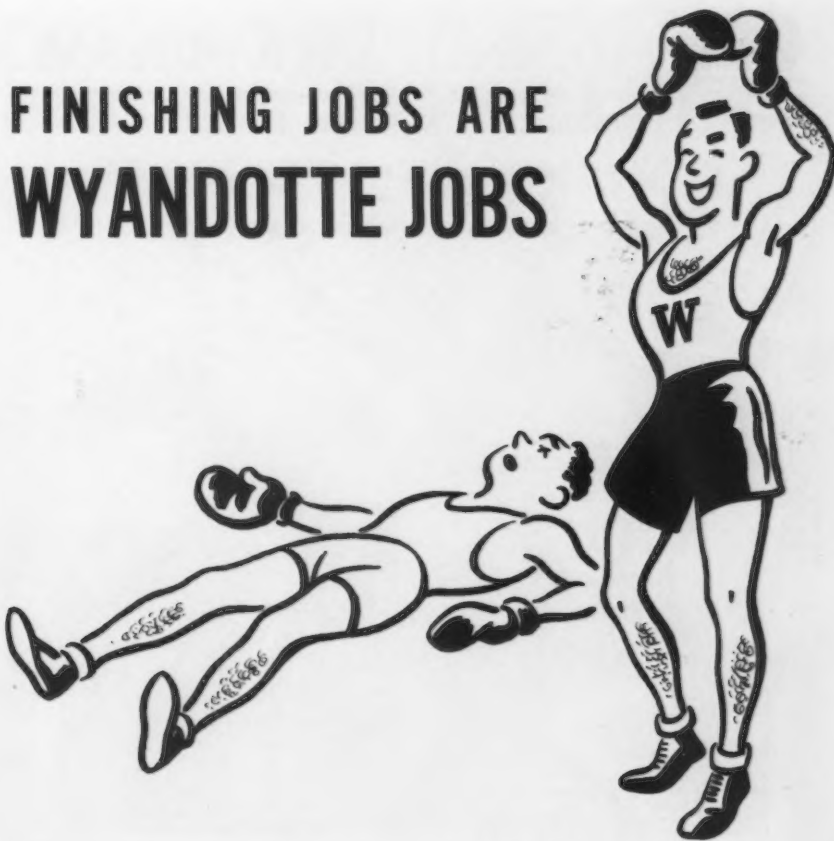
Speed of operation has gone up while maintenance and power costs have gone down in the Geneva, N. Y., division of the Burnham Boiler Corp., manufacturer of low-pressure heating boilers. About three years ago, General Electric a.c. transformer-type welders, including two 500-amp. units, were substituted for the d.c. units previously used. Records kept since the changeover show a 75 per cent reduction in cost per foot of weld. Factors in this reduction are a 60 per cent decrease in welding time per boiler, 35 per cent cut in the amount of electrode used, and a 70 per cent lowering of power and maintenance costs. With the elimination of "magnetic blow" by use of alternating current, operators are able to work in boiler corners much more accurately and easily. The benefits obtained paid for the new equipment in eight months.

Labor Board Stands By Steel Wage Order

WASHINGTON—Standing by its order fixing a minimum steel labor hourly wage of 62½c. in the East, the Labor Department this week denied the request of 29 small steel companies in that district that the date be postponed to April 3. In a letter to Attorney Roberts B. Thomas,

representing the petitioning companies, Assistant Secretary of Labor C. V. McLaughlin said that the department had "given very exhaustive study to the whole problem of minimum wages in the steel industry" and that he felt "that more than adequate opportunity for presentation of every point of view had been afforded." Mr. McLaughlin pointed out that previously the effective date had been postponed from Jan. 31.

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... OBITUARY ...

HOMER M. WRIGHT, for the last 23 years a metallurgist with the Michigan Malleable Iron Co., died on Feb. 20, aged 47 years.



A. M. CLARK, president of the Columbia Steel Casting Co., Portland, Ore., died at San Francisco while on a vacation on Feb. 10, aged 68 years. Early in his career he went to Portland for the Columbia Engineering

Works and was later active in the development and growth of the Columbia Steel Co., which was formed in 1910. One year after the Columbia Steel Corp. was taken over by United States Steel Corp. in 1930, Mr. Clark purchased the foundry at Portland from the Steel Corporation.



D. A. BIRDSEYE, for 37 years identified with the Lamson & Sessions Co., Cleveland, as salesman and district sales manager of the Chicago terri-

tory, died Feb. 14 after a long illness. He was 56 years old.



COL. JOHN L. BUCHANAN, for many years an executive of the General Electric Co. and currently the coordinator of the company's activity at the New York World's Fair, died at the Greenwich Hospital, Greenwich, Conn., on Feb. 23, aged 55 years. He had been identified with the company since his graduation from the University of Illinois in 1904.



J. A. HEINSLER, assistant superintendent of the Huther Brothers Saw Mfg. Co., Rochester, N. Y., died at his home in that city on Feb. 16, aged 60 years.



FREDERICK M. MCPHERSON, for the past 26 years identified with the M. A. Hanna Furnace Co., a subsidiary of the Great Lakes Steel Corp., died recently at his home in Detroit. He was formerly superintendent of the old Pequest Furnace, Pequest, N. J., Oriskany Iron Co., and of the Buena Vista furnace in Virginia.



ABRAHAM RUSSELL GIFFORD, retired safety engineer of the Pittsfield, Mass., works of the General Electric Co., died at his home in that city on Feb. 20. Mr. Gifford served his apprenticeship as machinist at the Taunton Locomotive Works, Taunton, Mass., then became general foreman at Brown & Sharpe Mfg. Co., Providence, R. I., Draper Co., Hopedale, Mass., Sterling Mfg. Co., Fall River, Mass., and Packard Motor Co., Detroit. He went with the General Electric Co. in 1915 as general foreman of the motor punch press department; in 1934 was made division superintendent; in 1932 became safety engineer; and retired in September, 1935.




HENRY W. HORTON, former secretary of Buhl Sons Co., Detroit hardware warehouse, was buried Feb. 25 at Jefferson, Ohio. Mr. Horton was born Aug. 4, 1855, in Garretville, Ohio, and had lived in Detroit and Highland Park since 1887. He had been employed by Buhl Sons Co. 43 years prior to his retirement.




E. WILLIAM MYERS, president of Snap-On Tools, Inc., Kenosha, Wis., died on Feb. 15, aged 48 years. He


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was stricken several weeks ago while on a business trip in the East. The firm moved from Milwaukee to Kenosha in 1929 and since that time has established branch factories in Mt. Carmel, Ill., and Newport, Pa.

♦ ♦ ♦

ARTHUR R. SCHIELE, president, National Foremetal Co., Cleveland manufacturer of metal products, died Feb. 22, in Cleveland.

♦ ♦ ♦

EBENEZER FRANCIS, until four years ago district sales representative at Cleveland for the Erie Forge Co., Erie, Pa., died Feb. 22 in Cleveland, at the age of 80. Failing health caused his retirement in 1935. At one time he was a superintendent for the Otis Steel Co., Cleveland.

♦ ♦ ♦

WILLIAM C. EHRHARDT, secretary of the John C. Kupferle Foundry Co., St. Louis, died there following an illness of seven weeks. He was 67 years old, and had been connected with the company for 52 years.

Welded Frames Satisfactory For Intermediate Buildings

LIGHT welded steel frames, used in erecting a multiple unit dormitory at Stanford University, may well fill the need for a type of steel construction satisfactory for intermediate buildings of one or two stories, according to a report to the welding research committee of the Engineering Foundation, New York.

The building elements of the dormitory are studs and joists spaced as they usually are in wood construction. The steel used in the members was for the most part only 1/16 or 1/8 in. thick and all joints were made by arc welding. Advantages include a rigid type of construction which, if properly designed, is highly efficient in resisting earthquake shocks. The frame cannot be attacked by termites and it is more fire-resistant, thus reducing insurance rates.

"The annoying problem of shrinkage, ever present in wood construction, is eliminated," the report continues. "Because of the open web construction of the joists, a convenient location is given for placing conduits and pipes. Perhaps one of the greatest advantages is the speed of construction, the frames of the four buildings at Stanford having been erected in only 30 days."

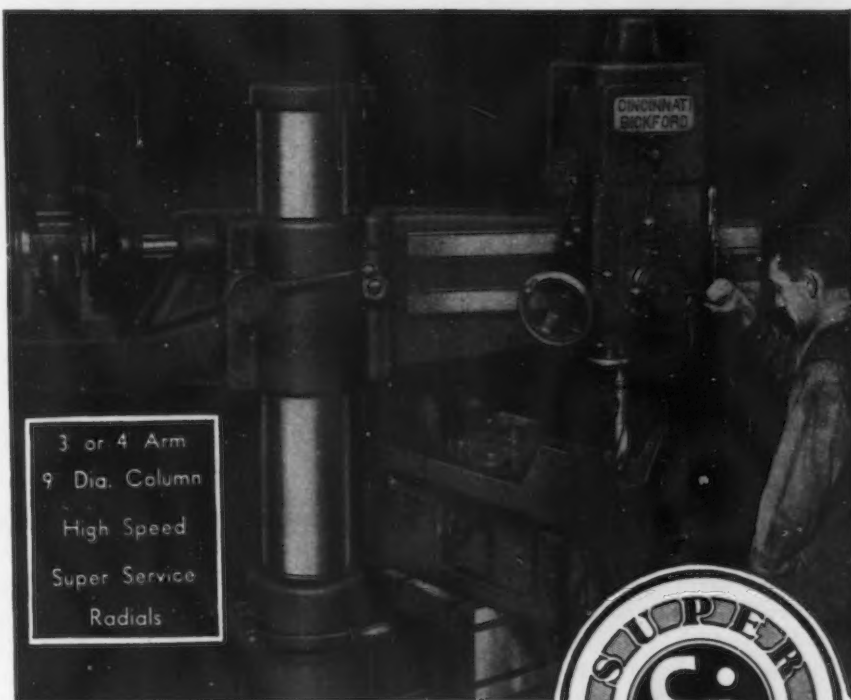
Heppenstall Chairman Awarded Plaque

PITTSBURGH — In connection with the celebration of the Heppenstall Co.'s 50th anniversary, C. W. Heppenstall, board chairman, was recently presented with a plaque in appreciation of his efforts in the growth of the company, which was founded as the Trethewey Mfg. Co. in 1889. The presentation was made by R. B. Heppenstall, who recently

succeeded his father as president of the company when C. W. Heppenstall was elected chairman of the board of directors. Employees of 10 or more years' service were awarded service buttons.

Wailes Dove-Hermiston Corp., New York, has appointed as distributors of Bitumastic protective coatings, of Brance-Krachy Co., Houston, Tex.; R. W. Hudgins & Son, Norfolk, Va.; The James Walker Co., Baltimore, and Industries Supply Co., San Diego, Cal.

FINGER TIPS CONTROL THIS High Speed RADIAL



For interchangeable manufacture and the full efficiency of rapid production jigs, you need the convenience and finger-tip ease of handling which the High Speed Super Service Radial provides.

The standard motor being mounted at the rear of the arm promotes balanced finger-tip control of the arm swing. The head is thus kept light and being mounted on anti-friction bearings, rolling on a hardened steel armway, makes for easy quick traverse along the arm and with a minimum of wear.

Bulletin R-21A describes in detail the high production features of this time-saving, money-saving machine. Write for your copy today.



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ATLANTIC STATES

AWARDS

- 500 Tons, Dayton, Pa., dam, to Bethlehem Steel Co., Bethlehem, Pa., through Dravo Corp., Pittsburgh (previously reported awarded to Jones & Laughlin Steel Corp.).
- 380 Tons, New York, East Side Drive, to Jones & Laughlin Steel Corp., Pittsburgh, through A. M. Hazel Co., Inc., New York.

- 225 Tons, Cato, N. Y., school, to Truscon Steel Co., Buffalo.

CENTRAL AND WESTERN STATES

- 1700 Tons, Mare Island, Cal., Navy warehouse, to Gilmore Fabricators, Inc., San Francisco; through MacDonald & Kahn, Ltd., San Francisco, contractor.
- 324 Tons, Detroit, Brewster housing addition, to Calumet Steel Co., Chicago.
- 299 Tons, San Francisco, Gompers School, to Truscon Co., San Francisco; through Anderson & Ringrose, San Francisco, contractor.
- 250 Tons, Owensboro, Ky., bridge over Ohio River, to Laclede Steel Co., St. Louis; through Hunter Steel Co., Pittsburgh.

- 185 Tons, Davenport, Iowa, elementary school to Joseph T. Ryerson & Son, Inc., through T. S. Willis, contractor.

- 172 Tons, Kent, Ohio, McGilvrey Hall, Kent State University to Carnegie-Illinois Steel Corp., Pittsburgh, through Carmichael Construction Co., Akron.

- 100 Tons, Cleveland, WPA requirements, to Builders Structural Steel Co., Cleveland.

PENDING STRUCTURAL PROJECTS

ATLANTIC STATES

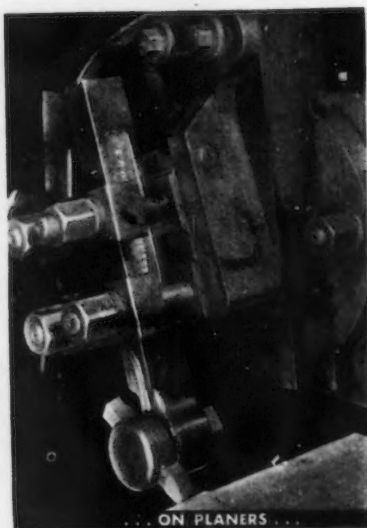
- 400 Tons, New Haven, Conn., sewage disposal plant.
- 225 Tons, Windsor, Conn., mesh and bars, State road.
- 160 Tons, Hoboken, N. J., Department of Agriculture building; bids close March 3.
- 150 Tons, Weehawken, N. J., high school.
- 150 Tons, Queens, N. Y., contract No. SC-39-6, grade separation, Cross Island Parkway; bids to Department of Parks until March 10.
- 135 Tons, East Park, N. Y., Junior and Senior High School; bids close March 6.
- 100 Tons, Dorchester, Mass., Columbia Circle underpass

CENTRAL AND WESTERN STATES

- 700 Tons, St. Joseph, Mo., sewer.
- 700 Tons, St. Louis, postoffice garage, J. S. Alberici, St. Louis; low bidder on general contract.
- 700 Tons, Owensboro, Ky., water and light plant additions.
- 200 Tons, Narrows, Va., Celanese Corp., rayon mill.
- 200 Tons, Chicago, film exchange
- 100 Tons, Brookings, S. D., dormitories.
- 100 Tons, Minneapolis, Natural History Museum.
- 100 Tons, Moorhead, Minn., paving work.
- Unstated tonnage, Sacramento, Cal., high school assembly; bids March 13.
- Unstated tonnage, Davis, Cal., university library-administration building; bids March 14.
- Unstated tonnage, Oakland, Cal., Bay Bridge administration building annex; bids March 15.

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With ARMSTRONG TOOL HOLDERS you are always ready for production, for tooling-up is reduced to the selection of cutters, adjusting for clearance, and tightening the set screws. There are no machine hours lost waiting for tool steel, for tool forging, for tool grinding, for heat treating or hardening. With a few cutter bits any mechanic can grind from stock shapes of high speed steel, each ARMSTRONG TOOL HOLDER is effectively equal to a complete set of forged tools, is ready to do a number of jobs.

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Bendix Sit-downers Hear News, Leave for Homes

FOUR hundred sit-down strikers of the aircraft division of Bendix Corp., South Bend, Ind., gave up and went home Monday when news of the Supreme Court decision on sit-down strikes was heard. The sit-down, which lasted five hours, reportedly was a protest against the company's failure to complete negotiations for a wage contract with the UAW. The workmen still, however, are on strike. The Bendix plant, in 1936, was the scene of the country's first major sit-down strike, which ended when the company agreed to a union contract.

Sit-down Strikes Illegal, Supreme Court Rules in Fansteel Case

WASHINGTON—The Supreme Court on Monday ruled that the sit-down strike is not the exercise of "the right to strike" given under the Wagner Act and that the strike is "illegal in its inception and prosecution."

In a long-awaited decision involving the Fansteel Metallurgical Corp., of South Chicago, Ill., the court in a five to two decision read by Chief Justice Charles Evans Hughes, said that the NLRB does not have authority to compel the reinstatement of workers discharged for participation in a sit-down strike.

The high court partly affirmed a Seventh Circuit Court of Appeals decision which invalidated a Labor Board order and which called upon the company to reinstate a group of workers who participated in a sit-down strike in February, 1937.

"... When employees resorted to that sort of compulsion," the court said, "they took a position outside the protection of the statute and accepted the risk of the termination of their employment upon grounds aside from the exercise of the legal rights which the statute was designed to conserve."

Reed, Black Dissent

Chief Justice Hughes said that "the important part is that respondent stood absolved by the conduct of those engaged in the sit-down from any duty to reemploy them, but respondent was nevertheless free to consider the exigencies of its business and to offer reemployment if it chose." Associate Justices Reed and Black dissented, and Associate Justice Frankfurter did not participate.

The court also ruled on two other cases involving the NLRB and in each case the Labor Board was the loser. It affirmed a Seventh Circuit Court of Appeals decision which had set aside an NLRB order against the Columbian Enameling & Stamping Co., of Terre Haute, Ind., and it took similar action with respect to a Sixth Circuit Court of Appeals decision invalidating an NLRB cease and desist order against the Sands Mfg. Co., Cleveland.

Rules In Other Cases

In the Columbian Enameling case the NLRB had ordered the company to reinstate a group of workers who

went on strike March, 1935, and to cease and desist from certain other alleged unfair labor practices. The Circuit Court had invalidated the order solely on the grounds that the workers had struck in violation of a no-strike agreement. Justice Stone, in the majority opinion, said the court could find no substantial evidence that the company had refused to bargain with the union.

In the case involving the Sands Mfg. Co., the Circuit Court had set aside the NLRB order on the grounds

that the board's findings, on which the order was based, were directly contrary to the evidence in the case. The board had found that the company had allegedly discriminatorily locked out members of the union—the Mechanical Educational Society of America—and had failed to bargain in good faith with the union. Associate Justice Roberts read the majority opinion, which said that the evidence in support of the board's finding that the strike resulted from unfair labor practices by the management "does not amount to a scintilla when considered in the light of respondent's long course of conduct in respect of union activities and in dealing freely and candidly with the union involved."



ESKIMOS put finishing touches on steel framework of World's Fair idea of Igloo of Tomorrow which will house the air conditioning exhibit of Carrier Corp., Syracuse, N. Y. Four steelworkers don Eskimo suits to celebrate welding of the last girder into place on the streamlined Arctic snowhut. When completed the Igloo will be completely "snow" encrusted. The exhibit will show the complete story of air conditioning from the first commercial installation 37 years ago.

H. G. DALEY, for the past two years vice-president in charge of sales, Sweet's Steel Co., Williamsport, Pa., has been elected president, succeeding H. P. LADDS, who has resigned to become president of the National Screw & Mfg. Co., Cleveland. WILLIAM F. SPILKA, who has been identified with the company since 1937 as assistant to the president, has been elected executive vice-president. Officers reelected included K. E. CROOKS, vice-president; H. R. BOSTON, secretary and treasurer; C. E. LYNCH, assistant secretary and assistant treasurer, and J. E. CUPP, general counsel.

Mr. Daley became identified with the Sweet's Steel Co. as sales manager in 1928. His career in the steel industry started in 1912 in the sales department of the Carnegie Steel Co., where he was employed until 1917. After serving in the Navy during the War, he returned to the United States Steel Corp. in 1919 and was sent to Pittsburgh for mill training and the study of metallurgy. Upon completion of the course, he was appointed sales representative in Philadelphia and eastern Pennsylvania for the Carnegie Steel Co., Tennessee Coal, Iron & Railroad Co. and the Illinois Steel Co., and remained in that capacity until his association with the Sweet's Steel Co. in 1928.

Mr. Spilka was formerly manager of the construction department for Sears, Roebuck & Co., Philadelphia, and later was vice-president and general manager of Velent Co.

♦ ♦ ♦

WILLIAM E. HOLLER, general sales manager, Chevrolet Motor Division, General Motors Corp., will be the guest speaker at the annual banquet of the National Automobile Dealers Association to be held in San Francisco, April 19.

♦ ♦ ♦

H. P. CURTIS, of Los Angeles, has been appointed Western representative of the Edward G. Budd Mfg. Co., Philadelphia. With the development of its aircraft business, the Budd company is considering the advisability of organizing a branch plant in California.

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DEAN BRADLEY STOUGHTON was the guest of honor at the National Officers' Night dinner given by the Lehigh Valley chapter of the American Society for Metals, on Feb. 3. In token of Dean Stoughton's "effective services to the metallurgy of the region, of his service as past chairman of the chapter, and as national

treasurer of the society," the chapter presented him with a gold stop watch.

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K. T. KELLER, president of the Chrysler Corp., is Michigan general chairman of a committee to make arrangements for the observance of Army Day, April 6.

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HARRY M. TALIAFERRO, president of the American Seating Co., Grand Rapids, Mich., has been appointed



H. G. DALEY



FRANCIS B. MORGAN, who as announced recently in these columns, has been elected vice-president of the Electro Metallurgical Co., a unit of the Union Carbide & Carbon Corp.

... PERSON

general chairman of the eighth annual Michigan State-wide Safety Conference to be held in Detroit, May 22 to 24, at Hotel Book-Cadillac. Recently, Mr. Taliaferro was elected president of the Grand Rapids Association of Commerce.

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A. N. BENSON, general manager, National Automobile Dealers Association since April, 1936, announced his resignation on Feb. 22. W. E. BLANCHARD, assistant general manager, became acting manager.

♦ ♦ ♦

J. W. BRUSSEL, factory manager of Federal-Mogul Corp., Detroit, has joined Bendix Aviation Corp. He is succeeded at Federal-Mogul by E. C. GARLENT.

♦ ♦ ♦

M. J. SANDLING has been named vice-president and sales manager of Howell Electric Motor Co., Howell, Mich. Mr. Sandling has been in charge of sales in outstate Michigan.

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W. B. GIVEN, JR., president of American Brake & Shoe Foundry Co., has been elected a director of Westinghouse Air Brake Co. to fill a vacancy caused by the death of J. M. LOCKHART.

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W. J. RAMSEY has been appointed field engineer in the sales department of Mathews Conveyer Co., with headquarters at Philadelphia. He is a graduate of Franklin Institute and Drexel Institute. He has been with the Mathews company since 1929, and from 1931 to his present appointment was manager of advertising and sales promotion. Prior to his connections with Mathews Conveyer Co., Mr. Ramsey was employed by the Baldwin Locomotive Works and the Haslett Chute & Conveyor Co.

HENRY E. HELLING, JR., formerly assistant advertising manager, will succeed Mr. Ramsey as advertising manager at Ellwood City, Pa.

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C. S. CHING, director of industrial and public relations for the United States Rubber Co., will talk on "All Quiet on the Industrial Front" at an all-day Eastern regional conference

PERSONALS . .

sponsored by the Industrial Marketers of New Jersey, chapter of the National Industrial Advertisers Association, at the Newark Athletic Club on March 15.

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HOWARD E. OBERG, vice-president of the Billings & Spencer Co., Hartford, Conn., has been elected a director of the company.

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HARRY EBRIGHT, who has been associated with the porcelain enameling industry for almost 20 years, has joined the staff of the Chicago Vitreous Enamel Products Co., Chicago.

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JACK SMITH, formerly in charge of the St. Louis district for the United States Electrical Tool Co., Cincinnati, has been placed in charge of sales for the Southeastern territory, with headquarters in Atlanta, Ga., ROBERT C. UPHAM, who was field service representative throughout the United States, assumes charge of the St. Louis branch office.

♦ ♦ ♦

JOHN T. HARDING, formerly an economist for several Government departments, has been appointed to the staff of the economic research division of the National Industrial Conference Board, New York, to handle various aspects of foreign relations. He will maintain contacts with the board's foreign correspondents in 20 countries and will be in charge of the monthly round-table discussions on foreign trade and international affairs.

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ROBERT K. KULP, formerly research metallurgist of the Lukens Steel Co., Coatesville, Pa., is now associated with the Timken Roller Bearing Co. as research metallurgist, steel and tube division, Canton, Ohio.

♦ ♦ ♦

R. C. ARTNER, formerly assistant treasurer of Midland Steel Products Co., Cleveland, has been elected treasurer to fill the vacancy caused by the death of R. M. Fisher.

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WALTER ERMAN, of Erman-Howell & Co., Inc., Chicago, has been appointed chairman of the public rela-

tions committee of the Institute of Scrap Iron and Steel, Inc., New York. and PHILIP W. FRIEDER, of the company of the same name, Cleveland, has been made chairman of the brokers' committee. CHARLES D. JACOBSON, manager of the David J. Joseph Co., Houston, Tex., has been elected president of the Gulf Coast chapter of the institute.

♦ ♦ ♦

HERBERT D. HALL, sales engineer, Vandyck Churchill Co., New York.



GEORGE F. EVANS (above), formerly general manager of Beals, McCarthy & Rogers, Inc., Buffalo, who as announced in these columns recently was made vice-president and treasurer. EUGENE F. MCCARTHY (below) who was appointed vice-president and secretary.



has been elected chairman of the New York-New Jersey Chapter, American Society of Tool Engineers. P. W. BROWN, general superintendent, Wright Aeronautical Corp., Paterson, N. J., has been named the new vice-chairman, succeeding Mr. Hall. REMO REGE, manager, production engineering department, Wright Aeronautical Corp., was reelected treasurer, and BEN C. BROSHIER, American Machinist, New York, secretary.

♦ ♦ ♦

HARLAN M. GALE, formerly connected with the Cleveland Varnish Co. and the Glidden Co., has been appointed sales representative for the New England territory by Maas & Waldstein Co., Newark, N. J.

♦ ♦ ♦

LEONARD LARSON has been named chief engineer of the Cleveland district of Republic Steel Corp. He has been associated with Republic and its predecessors for 22 years. Mr. Larson was born in Pittsburgh, attended Carnegie Tech, and in 1917 entered the employ of the Central Steel Co., in Massillon. In 1929 he was appointed chief engineer of the Central Alloy Steel Co., at Canton.

♦ ♦ ♦

R. H. BAHNEY succeeds Mr. Larson as chief engineer of the Central Alloy district of Republic Steel Corp., at Canton, Ohio. Following graduation from Cornell University in 1917, he was employed as a clerk in the electrical offices at Massillon, then served successively as assistant chief electrician and chief electrician, going to Canton as chief electrician with the Central Alloy Steel Co., in 1926. He became assistant superintendent of mechanical and electrical departments for the Canton division of Republic, in 1931, and in 1936 was transferred to the engineering department as electrical engineer.

♦ ♦ ♦

JOHN F. CALLAHAN, member of the advertising staff of the air reduction sales Co., New York, since 1921, has been appointed assistant advertising manager of the company. G. Van Alstyne is advertising manager.

Pittsburgh Foundry Proposes 15% Pay Cut

PITTSBURGH — Pittsburgh Steel Foundry Corp., Glassport, Pa., has notified the SWOC that it desires to cut wages 15 per cent, but has proposed that it will restore the cut whenever operations become profitable for a period of three months. No decision has been reached between the union and the company.

Court Order Blocks Minimum Steel Rate

WASHINGTON—An order temporarily restraining the Secretary of Labor and five other Cabinet officers from putting into effect March 1 the 62½c. minimum wage rate fixed in the steel wage decision was issued by Judge Jennings Bailey in the U. S. District Court for the District of Columbia on Monday. The order was sought by the Lukens Steel Co., of Coatesville; the Alan Wood Steel Co., of Conshohocken, and the Central Iron & Steel Co., of Harrisburg, Pa. These three companies had joined with four other independent steel producers in the East in the suit and were singled out because they planned immediately to bid on Government work.

The brief filed by the plaintiffs said that the Navy Department was to open bids on March 2 for 8352 tons of plates, sheets and strips and on March 9 for 600 tons of I-beams—products on which the three companies have submitted bids. These steel requirements are for the battleship Alabama.

Justice Bailey fixed March 6 for further arguments on the merits of the case. Plaintiffs were required to post a \$25,000 bond. If the temporary injunction is prolonged beyond March 5, it was indicated that arguments on a permanent injunction would not be heard for at least a month.

SWOC Collectors Line Up At Pittsburgh Mill Gates

THE Steel Workers Organizing Committee's pickets this past week staged a brief dues-collecting drive at gates of Crucible Steel Co. of America's LaBelle plant in Pittsburgh. The demonstration, similar to those at other plants did not interfere with production.

Power Output Up 15% for One Company

POWER output of the electric subsidiaries of the American Water Works & Electric Co. for the month of January totaled 199,564,801 kilowatt hours, against 173,996,621 kilowatt hours for the corresponding month of 1938, an increase of 15 per cent.

Budd May Build California Plant

E. G. BUDD MANUFACTURING CO. is considering construction of a branch plant in California in connection with planned expansion of its production of airplane assemblies of stainless steel.

January Steel Exports Lower

EXPORTS of iron and steel products (scrap excluded) totaled 134,788 gross tons valued at \$10,214,547 in January, preliminary figures released by the Metals and Minerals Division of the Bureau of Foreign and Domestic Commerce reveal. In December this trade had amounted to 166,404 tons valued at \$11,506,216 and in January, 1938, to 229,757 tons valued at \$14,958,542.

Declines of 14,297 tons in shipments of pig iron (reducing the January trade to only 6325 tons), and of 10,175 tons in exports of non-alloy, non-fabricated plates (bringing the total of this trade down to 9751 tons) accounted for the greater part of the 31,616-ton January decline. Exports of non-alloy ingots, tin plate, and non-alloy black steel sheets gained.

ICC Report Favors Rail Cut for South's Factories

WASHINGTON—No changes in rates on rolled iron and steel are proposed in a report announced Monday by Commissioner Lee and Examiner Corcoran, of the Interstate Commerce Commission, concerning a comprehensive revision of manufactured articles from the South.

The report in suggesting that the commission should find that rates on an extensive list of products, including metal lines, are unreasonable and unduly preferential to Northern producers, said that it is desirable that an attempt should be made to agree upon the specific bases to be established with subsequent reference to the commission of any details upon which agreement cannot be reached. For this reason the report said no order should be entered regarding the bases to be established.

The report said that the commission should find that rail rates from Southern territory to destinations in Central, Trunk Line and New England territories on 13 products are unreasonable to the extent they are upon levels higher than at present in effect on like articles within the North. Included in the list of products are stoves, cast iron pipe fittings, cast iron service boxes, iron body valves, fire hydrants, brass pipe fittings, and brass cocks and valves.

AFL-CIO Peace Soon Considered Unlikely

WASHINGTON—"Ultimately but not now" seems to be the prevailing view regarding prospects of peace between AFL and CIO. Differences between the two labor organizations and their respective heads, William Green and John L. Lewis, are held to be so deep-seated that doubt exists that, despite the renewed urgent appeal of President Roosevelt, they can reach an early agreement to bury the hatchet and unite into a single labor front.

Each labor leader obviously would be reluctant to become subordinate to the other. In previous moves toward peace, Mr. Lewis has offered to resign as leader of the CIO if Mr. Green would resign as head of the AFL. This possibly was only a gesture or a strategic move on the part of Mr. Lewis which met with expected silence by Mr. Green. Certainly there is no expectation that Mr. Green would today voluntarily step out as president of the AFL even at the price of peace. There is even less reason at present than in the past for his doing so because AFL stock has been rising while CIO stock is on the decline, though its standing has not fallen to anything like the degree some of its opponents affect to believe.

Despite these and fundamental organizational obstacles, there is a belief that in some manner, possibly after long and difficult negotiations, peace, which the Administration sees as a necessity if political success in 1940 is to be achieved, may be established.

The proposed peace negotiations, long under discussion between high ranking Government officials and labor leaders, was openly espoused by Secretary of Commerce Hopkins in his address at Des Moines last Friday night, timed nicely with letters from the President to Mr. Green and Mr. Lewis, received the day following.

Meantime, in order that no fly might get into the ointment of peace, Senator Thomas, Democrat of Utah, chairman of the Committee on Education and Labor, announced indefinite postponement of hearings on proposed amendments to the National Labor Relations Act. The AFL had proposed sweeping changes in the act, while the CIO has strongly opposed any amendment.

Morehead Medal to John J. Crowe

THE JAMES TURNER MOREHEAD MEDAL has been awarded to John J. Crowe, research engineer, Air Reduction Sales Co., New York, for his unceasing and successful technical activities in the utilization of acetylene. The medal will be presented during the 39th convention of the International Acetylene Association, to be held at Houston, Texas, March 8-10.

The Morehead Medal is awarded annually by the association to the person or persons who in the judgment of its officers and board of directors have done most to advance the industry or the art of producing or utilizing calcium carbide or its derivative, the most important of which is the gas, acetylene.

Mr. Crowe has been engaged in research and developmental engineering ever since he completed his education in Washington, his home city. He is well known for his studies of metallurgical phenomena, his effective cooperation in the establishment of several leading metallurgical laboratories, and his outstanding work in the de-



JOHN J. CROWE

velopment of apparatus for oxy-acetylene welding and cutting.

From his first job as apprentice at the National Bureau of Standards Mr.

Crowe advanced to associate physicist in charge of a section of the Bureau, and in 1915 was "loaned" to the United States Navy Department to assist in solving many complex metallurgical problems relating to the construction of aircraft and naval ships. He was responsible for the establishment of physical testing and metallurgical laboratories at several of the navy yards. It was during his association with the Philadelphia Navy Yard that Mr. Crowe had his first real contact with practical applications of fusion welding and cutting by the oxy-acetylene process, and by these applications he was able to effect great savings in the cost of producing large forgings and castings.

More recently Mr. Crowe has been responsible for the development of many new types of apparatus, in addition to countless improvements on other equipment. He has written a number of noteworthy papers on various phases of the oxy-acetylene process. He is a past president of the American Welding Society and of the Compressed Gas Manufacturers' Association, and a past chairman of both the Philadelphia and New York sections of the American Society for Metals.

CAST IRON PIPE

Newburyport, Mass., water commissioners will take bids until March 8 on 200 tons of pipe, various sizes, mostly 16-in. Willard S. Little is chairman of commission.

Linden, Wis., has plans by W. G. Kirchhoffer, consulting engineer, Madison, Wis., for water main extensions and other improvements costing about \$35,000 as WPA project. Leonard Trudgeon is village clerk.

Eagle River, Mich., is starting work on \$55,000 water distributing system as WPA project.

Board of Trustees, Quindaro Township, near Kansas City, Kan., care of Charles A. Haskins, Finance Building, Kansas City, Mo., consulting engineer, plans pipe line extensions in water system along Mearman and Sortor Roads, about four and one-half miles. Financing is being arranged.

Bartlett, Tex., will ask bids early this month for pipe lines for water system and other waterworks installation. Cost about \$30,000. Harold B. Gieb, Mercantile Building, Dallas, Tex., is consulting engineer.

Western Star, Ohio, plans pipe lines for water system. Cost about \$26,500. Financing is being arranged, including bond issue for part of fund.

Oak Harbor, Ohio, plans pipe line extensions and improvements in water system, and other waterworks installation. Cost about

\$130,000. Carleton S. Finkbeiner, Nicholas Building, Toledo, Ohio, is consulting engineer.

Water Department, City Hall, Houston, Tex., plans extensions in pipe lines, including several large diameter main lines in parts of 16 streets; also additional pumping machinery at waterworks station on Sabine Street. Appropriation of \$134,000 has been approved for work. This is part of general expansion and improvements in water system to cost about \$1,000,000.

Galveston County Fresh Water Supply District No. 2, Galveston, Tex., plans pipe lines for water system near LaMarque, including pumping machinery and other waterworks installation. Cost close to \$70,000. H. G. Olmsted is engineer.

Agency, Iowa, plans pipe lines for water system; also elevated steel tank and tower, pumping machinery and other waterworks installation. A bond issue is being arranged.

Wenatchee, Wash., has approved pipe line project for water system and other waterworks installation, including 44,000 ft. of 6-in., 1550 ft. of 12-in., and 6200 ft. of 16-in. pipe; also for 40 new fire hydrants. Cost \$367,442, of which \$206,925 has been secured through Federal aid. James Dunstan is city engineer.

South Bend, Wash., plans pipe line extensions and replacements in water system. Cost about \$25,000. Financing is being arranged.

Puyallup, Wash., plans pipe line extensions in water system, including new line from North Puyallup to Sumner Cemetery, about

5000 ft., and other waterworks installation. Cost about \$39,000. Financing is being arranged through Federal aid.

Water Commission, Corvallis, Ore., has let contract to Empire Construction Co., Portland, for about 21,000 ft. of 20-in., and 21,000 ft. of 16-in., cast iron pipe and accessory materials for main pipe line from Rock Creek to Baldy Butte reservoir. Cost \$148,880.

Treasury Procurement Office, San Francisco, opened bids March 1 on 1500 ft. of 20-in. pipe for delivery at Oakland, Cal.

Burbank, Cal., opens bids March 7 on 6000 ft. of 6-in. and 2600 ft. of 8-in. pipe, class 250.

Pamphlet on Grinding Kinks Published in German

THE publishing house of Carl Hanser in Munich (Herzog-Rudolph-Strasse 19), has issued the seventh pamphlet in a series on shop kinks (*Werkstattkniffe*), this one being devoted to grinding practice. The author is Dipl.-Ing. Kurt Potyka of Frankfurt a. M. Bound in paper covers, this 8 x 6-in. booklet contains 64 pages and 52 illustrations and tables. The text is in German. Foreign sale price is R.M. 1.80.

Current Metal Working Activity

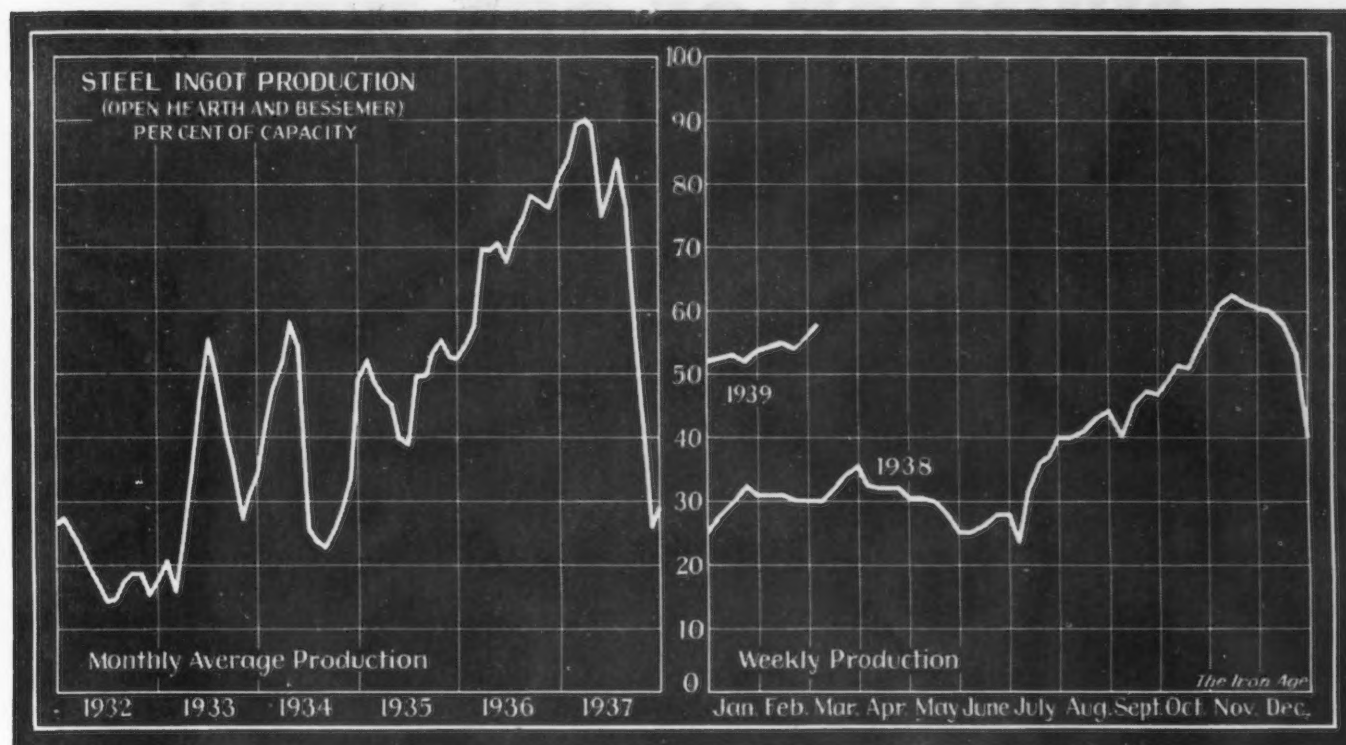
Latest Data Assembled by THE IRON AGE from Recognized Sources

	January 1939	December 1938	November 1938	December 1937	Twelve Months 1938	Twelve Months 1937
Steel Ingots: (gross tons)						
Monthly output ^a	3,186,834	3,143,169	3,572,220	1,473,021	27,839,261	49,502,907
Average weekly output ^a	719,376	711,124	832,685	333,263	533,933	949,423
Per cent of capacity ^a	52.69	53.00	62.05	25.37	39.79	72.38
Pig Iron: (gross tons)						
Monthly output ^b	2,175,423	2,201,627	2,269,983	1,490,324	18,773,135	36,611,317
Raw Materials:						
Coke output ^c (net tons)	3,444,256	3,441,545	3,347,723	2,996,525	32,661,392	52,375,500
Lake Ore consumed ^d (gross tons) ..	2,926,706	3,040,700	3,150,073	1,916,588	25,703,050	53,996,076
Castings: (net tons)						
Malleable, orders ^e		35,633	36,643	19,753	289,384	549,972
Steel, orders ^e		38,342	30,428	27,024	333,278	877,459
Finished Steel: (net tons)						
Trackwork shipments ^a	2,909	2,620	2,276	3,804	34,710	92,121
Fabricated shape orders ^f		163,445	153,084	99,070	1,256,639	1,628,641
Fabricated plate orders ^g		28,218	20,213	27,463	285,061	428,884
U. S. Steel Corp. shipments ^h	789,305	694,204	679,653	489,070	6,625,368	12,748,354
Fabricated Products:						
Automobile production ^b	353,946	407,016	390,350	347,349	2,655,777	5,016,437
Steel furniture shipments ⁱ		\$1,982†	\$1,707†	\$2,125†	\$20,356†	\$26,973†
Steel boiler orders ^j (sq. ft.)		891,926	635,108	546,615	7,729,259	9,923,457
Locomotives ordered ^k	8	28	3	77	228	368
Freight cars ordered ^k	3	2,674	132	3,287	16,539	52,788
Machine tool index ^l	150.8	146.5	112.2	142.7	125.6†	140.8†
Foundry equipment index ^k	122.3	141.8	89.7	111.2	106.5†	142.4†
Non-Ferrous Metals: (net tons, domestic only)						
Lead shipments ^l	40,189	33,908	42,030	34,020	421,625	575,933
Lead stocks ^l	117,214	115,902	115,236	129,131
Zinc shipments ^m	42,526	38,999	43,693	28,675	395,199	569,241
Zinc stocks ^m	128,220	126,604	120,778	65,333
Tin deliveries ⁿ (gross tons)	4,330	3,400	3,535	5,020	50,660	83,665
Refined copper deliveries ^o	54,827	47,680	64,557	22,788	607,081	865,893
Refined copper stocks ^o	301,110	289,755	269,488	259,351
Exports: (gross tons)						
Total iron and steel ^p		490,095	646,157	626,408	5,152,707	7,567,847
All rolled and finished steel ^p		123,006	120,610	191,432	1,392,639	2,125,174
Scrap ^p		321,261	448,020	319,016	2,979,006	4,039,143
Imports: (gross tons)						
Total iron and steel ^p		28,767	27,627	25,792	264,551	533,160
Pig iron ^p		1,237	1,493	9,128	33,088	111,697
All rolled steel ^p		12,774	12,554	13,618	155,536	266,546
British Production: (gross tons)						
Pig iron ^q	500,500	445,800	461,500	783,800	6,762,700	8,495,200
Steel Ingots ^q	811,700	655,700	860,000	1,103,800	10,393,800	12,964,000

† Three months' average. ‡ 000 omitted.

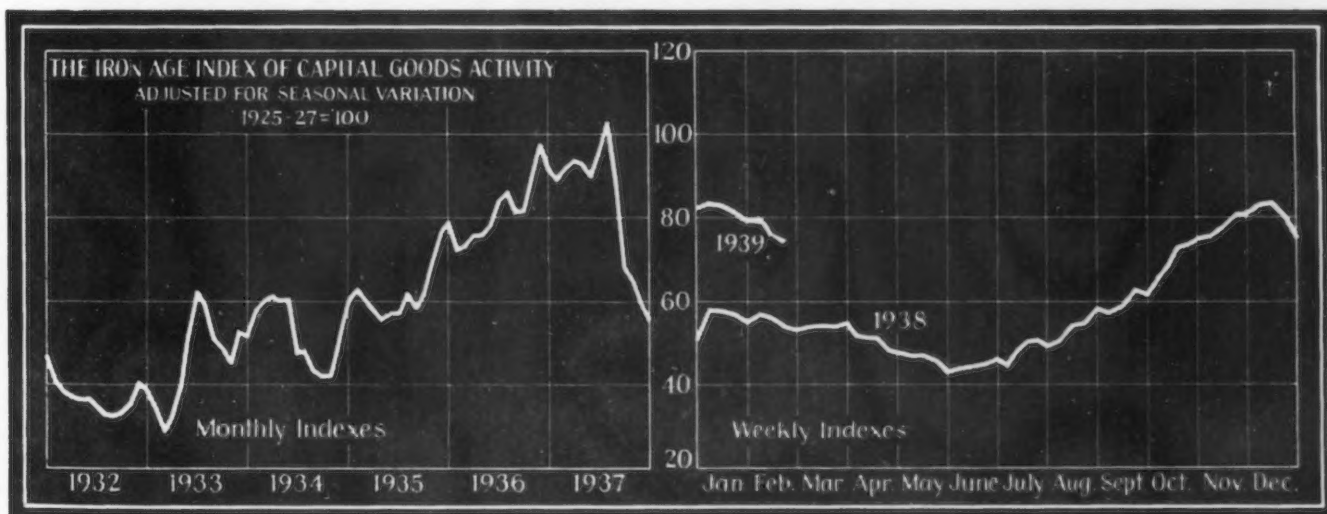
Source of data: ^aAmerican Iron and Steel Institute; ^bTHE IRON AGE; ^cBureau of Mines; ^dLake Superior Iron Ore Association; ^eBureau of the Census; ^fAmerican Institute of Steel Construction; ^gUnited States Steel Corp.; ^hPreliminary figures from Ward's Automotive Reports—Final figures from Bureau of the Census, U. S. and Canada; ⁱRailway Age; ^jNational Machine Tool Builders Association; ^kFoundry Equipment Manufacturers Association; ^lAmerican Bureau of Metal Statistics; ^mAmerican Zinc Institute; ⁿNew York Commodity Exchange; ^oCopper Institute; ^pDepartment of Commerce; ^qBritish Iron and Steel Federation.

Ingot Production Rises 1½ Points to 55½ Per Cent



District	Ingots	CURRENT WEEK..	Pittsburgh	Chicago	Valleys	Philadelphia	Cleveland	Buffalo	Wheeling	Detroit	Southern	S. Ohio	Western	St. Louis	East-ern	Aggregate
Production, Per Cent of Capacity		51.0	56.0	47.0	38.0	50.0	32.0	90.0	75.0	72.0	53.5	60.0	56.0	60.0	60.0	55.5
		48.0	53½	45.0	38.0	51.0	29.5	86.0	79.0	72.0	53.5	60.0	60.0	60.0	60.0	54.0

Capital Goods Index Dips 1.6 Points in Holiday Week



OUTSIDE of a seasonal increase in heavy construction awards, the past holiday week brought very few encouraging statistical reports of activity in the capital goods industries. Steel output, automobile assemblies and Pittsburgh district activities were all below the previous week's levels; lumber carloadings were fractionally higher. A substantial portion of the increase in construction awards was due to a \$7,500,000 contract for a steam power plant in North Carolina and a \$3,000,000 contract for a section of an apartment development in New Rochelle, N. Y. The losses for the week, after conversion to index numbers, more than equaled the advances,

causing THE IRON AGE capital goods index to decline 1.6 points to 75.1.

	Week Ended Feb. 25	Week Ended Feb. 18	Comparable Week	
Steel ingot production ¹	74.2	77.7	1938	1929
Automobile production ²	79.9	84.4	39.2	117.0
Construction contracts ³	104.4	104.3	61.4	129.1
Forest products carloadings ⁴	44.9	44.8	75.6	132.7
Production and shipments, Pittsburgh District ⁵	71.9	72.3	50.3	116.9
Combined index	75.1	76.7	56.0	122.4

Sources: 1. THE IRON AGE; 2. Ward's Automotive Reports; 3. Engineering News-Record; 4. Association of American Railroads; 5. University of Pittsburgh.

... SUMMARY OF THE WEEK ...

... Ingot rate rises to 55½ per cent, high of year thus far.

o o o

... New business has not shown much, if any, gain.

o o o

... Southern Pacific buys 40 locomotives; other railroad buying light.

STEEL price announcements for the second quarter, which are expected this week, probably will reaffirm present quotations on a majority of products, but may include revisions of extras and deductions on sheets and strip and a change in the quantity discount on sheets, strip and bars whereby the \$3 a ton allowance will apply on quantities of 75 tons and over instead of on 150 tons as at present. The only change in base prices in prospect is a \$2 a ton advance on hot rolled sheets, which would equalize the prices on the more common widths and gages of hot rolled, single pickled annealed with cold rolled mill run sheets, which at present are separated by a differential of \$2 a ton.

No change in pig iron prices is expected. Some producers will open their books this week for second quarter contracts. A reduction of \$3 a ton on all grades of pig iron in Canada has no bearing on the domestic price situation.

Evidence of moderate improvement in the steel situation is afforded this week by a rise in the ingot production rate for the industry of a point and a half to 55½ per cent, highest of the year thus far, and continued strength in scrap markets, though prices have not advanced.

WHILE the volume of new steel business has not gained to a marked degree, some of the steel mills have benefitted from the release of specifications against orders on their books, particularly for construction steel, shipbuilding requirements and railroad material. The two major producing districts have gained rather sharply, Pittsburgh having gone up three points to 51 per cent and Chicago two and a half points to 56 per cent. There have been increases also in a few other districts, notably Wheeling-Weirton, Youngstown and Buffalo, but the Detroit district is off four points to 75 per cent, Ford Motor Co. having shut down three open-

hearth furnaces, a possible indication of an excess of raw steel.

The automobile industry is still taking fairly good deliveries of steel, some of which is against low-priced contracts for sheets and strip placed last fall, but its new purchases are confined to fill-in lots. This policy of hand-to-mouth buying may be pursued until present inventories of steel and manufactured parts near exhaustion, which may not be until the latter part of March. Assemblies of motor cars are believed to have passed their low point of the season; a rising trend during March may result in a total output of about 350,000 cars in the month.

Railroad purchases have dropped off rather sharply, but the week has brought the largest locomotive order in some time, 40 engines for the Southern Pacific, 28 of which will be built by the Baldwin Locomotive Works and 12 by the Lima Locomotive Co. The Lehigh & New England has ordered 100 hopper cars, and there have been some smaller equipment orders. The Maine Central will purchase 500 cars from the Bethlehem Steel Co. and the Magor Car Corp., and its affiliated road, the Boston & Maine, may come into the market for as many as 2000 box cars. New rail orders are light. The Illinois Central has placed 8500 tons. Pending inquiries include 4400 tons for the Kansas, Oklahoma & Gulf and 2300 tons for the Richmond, Fredericksburg & Potomac.

Following a few weeks of extreme dullness, fabricated structural steel contracts have gained a little, totaling about 19,500 tons for the week, including 8600 tons for a bridge at Rock Island, Ill., 2500 tons for a du Pont plant at Seaford, Del., and 1060 tons for a Norfolk & Western bridge. New projects out for bids total nearly 18,000 tons.

SEVERAL events of unusual interest to steel and metal-working industries have occurred within the week, the effect of which may be helpful to business; the assurances of Secretary of Commerce Hopkins that the administration will place emphasis henceforth on recovery rather than reform; the decisions of the United States Supreme Court overruling the National Labor Relations Board in three important cases, which point to possible revision of the Wagner Act; the appeal of President Roosevelt to the American Federation of Labor and the Congress of Industrial Organizations for labor peace; the injunction granted to several eastern steel companies by a District of Columbia court restraining application of the 62½c. per hr. minimum wage rate ordered by the Department of Labor.

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Rails and Semi-finished Steel

Per Gross Ton:	Feb. 28, 1939	Feb. 21, 1939	Jan. 31, 1939	Mar. 1, *1938
Rails, heavy, at mill	\$40.00	\$40.00	\$40.00	\$42.50
Light rails: Pittsburgh, Chicago, Birmingham	40.00	40.00	40.00	43.00
Rerolling billets: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point	34.00	34.00	34.00	37.00
Sheet bars: Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point	34.00	34.00	34.00	37.00
Slabs: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point	34.00	34.00	34.00	37.00
Forging billets: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham	40.00	40.00	40.00	43.00
Wire rods: Nos. 4 and 5, Pittsburgh, Chicago, Cleveland	43.00	43.00	43.00	47.00
Skelp, grvd. steel: Pittsburgh, Chicago, Youngstown, Coatesville, Sparrows Point, cents per lb.	1.90	1.90	1.90	2.10

Finished Steel

Cents Per Lb.:	Feb. 28, 1939	Feb. 21, 1939	Jan. 31, 1939	Mar. 1, *1938
Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham	2.25	2.25	2.25	2.45
Plates: Pittsburgh, Chicago, Gary, Birmingham, Sparrows Point, Cleveland, Youngstown, Coatesville, Claymont	2.10	2.10	2.10	2.25
Structural shapes: Pittsburgh, Chicago, Gary, Buffalo, Bethlehem, Birmingham	2.10	2.10	2.10	2.25
Cold finished bars: Pittsburgh, Buffalo, Cleveland, Chicago, Gary	2.70	2.70	2.70	2.90
Alloy bars: Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton	2.80	2.80	2.80	3.00
Hot rolled strip: Pittsburgh, Chicago, Gary, Cleveland, Middletown, Youngstown, Birmingham	2.15	2.15	2.15	2.40
Cold rolled strip: Pittsburgh, Cleveland, Youngstown	2.95	2.95	2.95	3.20
Sheets, galv., No. 24: Pittsburgh, Gary, Sparrows Point, Buffalo, Middletown, Youngstown, Birmingham	3.50	3.50	3.50	3.80
Hot rolled sheets: Pittsburgh, Gary, Birmingham, Buffalo, Sparrows Point, Cleveland, Youngstown, Middletown	2.15	2.15	2.15	...
Cold rolled sheets: Pittsburgh, Gary, Buffalo, Youngstown, Cleveland, Middletown	3.20	3.20	3.20	...

On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

Cents Per Lb.:

	Feb. 28, 1939	Feb. 21, 1939	Jan. 31, 1939	Mar. 1, *1938
Wire nails: Pittsburgh, Chicago, Cleveland, Birmingham	2.45	2.45	2.45	2.75
Plain wire: Pittsburgh, Chicago, Cleveland, Birmingham	2.60	2.60	2.60	2.90
Barbed wire, galv.: Pittsburgh, Chicago, Cleveland, Birmingham	†3.30	3.20	3.20	3.40
Tin plate, 100 lb. base box: Pittsburgh and Gary	\$5.00	\$5.00	\$5.00	†\$5.35

*Pittsburgh prices only.
†Applies to 80-rod spools only.
‡Subject to post-season adjustment.

Pig Iron

Per Gross Ton:	Feb. 28, 1939	Feb. 21, 1939	Jan. 31, 1939	Mar. 1, *1938
No. 2 fdy., Philadelphia	\$22.84	\$22.84	\$22.84	\$25.84
No. 2, Valley furnace	21.00	21.00	21.00	24.00
No. 2, Southern Cin'ti	21.06	21.06	21.06	23.80
No. 2, Birmingham	17.38	17.38	17.38	20.38
No. 2, foundry, Chicago†	21.00	21.00	21.00	24.00
Basic, del'd eastern Pa.	22.34	22.34	22.34	25.34
Basic, Valley furnace	20.50	20.50	20.50	23.50
Malleable, Chicago†	21.00	21.00	21.00	24.00
Malleable, Valley	21.00	21.00	21.00	24.00
L. S. charcoal, Chicago	28.34	28.34	28.34	30.24
Ferromanganese, seab'd carlots	80.00	80.00	80.00	102.50

†The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Scrap

Per Gross Ton:	Feb. 28, 1939	Feb. 21, 1939	Jan. 31, 1939	Mar. 1, *1938
Heavy melting steel, P'gh...	\$15.75	\$15.75	\$15.625	\$13.75
Heavy melting steel, Phila...	15.25	15.25	15.25	14.75
Heavy melting steel, Ch'go...	14.25	14.25	13.75	12.25
Carwheels, Chicago	12.50	12.50	12.50	14.00
Carwheels, Philadelphia	16.75	16.75	16.75	15.25
No. 1 cast, Pittsburgh	15.50	15.50	15.50	15.75
No. 1 cast, Philadelphia	16.75	16.75	16.75	15.75
No. 1 cast, Ch'go (net ton)	12.75	12.75	12.75	11.75

Coke, Connellsville

Per Net Ton at Oven:	Feb. 28, 1939	Feb. 21, 1939	Jan. 31, 1939	Mar. 1, *1938
Furnace coke, prompt	\$3.75	\$3.75	\$3.75	\$4.00
Foundry coke, prompt	4.75	4.75	4.75	5.00

Non-Ferrous Metals

Cents per Lb. to Large Buyers:	Feb. 28, 1939	Feb. 21, 1939	Jan. 31, 1939	Mar. 1, *1938
Copper, electrolytic, Conn...	11.25	11.25	11.25	10.00
Copper, lake, New York	11.375	11.375	11.375	10.125
Tin (Straits), New York	46.00	45.40	46.45	41.875
Zinc, East St. Louis	4.50	4.50	4.50	4.75
Zinc, New York	4.89	4.89	4.89	5.10
Lead, St. Louis	4.60	4.60	4.70	4.35
Lead, New York	4.75	4.75	4.85	4.50
Antimony (Asiatic), N. Y.	14.00	14.00	14.00	15.75

The Iron Age Composite Prices

Finished Steel

	February 28, 1939	One week ago	One month ago	One year ago
2.286 a Lb.	2.286	2.286	2.286	2.512c.

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strip. These products represent 85 per cent of the United States output.

Pig Iron

	February 28, 1939	One week ago	One month ago	One year ago
\$20.61 a Gross Ton	20.61	20.61	20.61	23.25

Based on average for basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

Steel Scrap

	February 28, 1939	One week ago	One month ago	One year ago
\$15.08 a Gross Ton	15.08	14.875	13.58	13.58

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	HIGH	LOW
1939.	2.512c., May 17	2.211c., Oct. 18
1938.	2.512c., Mar. 9	2.249c., Jan. 4
1937.	2.249c., Dec. 28	2.016c., Mar. 10
1936.	2.062c., Oct. 1	2.056c., Jan. 8
1935.	2.118c., Apr. 24	1.945c., Jan. 2
1934.	1.953c., Oct. 3	1.792c., May 2
1933.	1.915c., Sept. 6	1.870c., Mar. 15
1932.	1.981c., Jan. 13	1.883c., Dec. 29
1931.	2.192c., Jan. 7	1.962c., Dec. 9
1930.	2.223c., Apr. 2	2.192c., Oct. 29
1929.	2.192c., Dec. 11	2.142c., July 10
1928.		

	HIGH	LOW
1939.	\$23.25, June 21	\$19.61, July 6
1938.	23.25, Mar. 9	20.25, Feb. 16
1937.	19.73, Nov. 24	18.73, Aug. 11
1936.	18.84, Nov. 5	17.83, May 14
1935.	17.90, May 1	16.90, Jan. 27
1934.	16.90, Dec. 5	13.56, Jan. 3
1933.	14.81, Jan. 5	13.56, Dec. 6
1932.	15.90, Jan. 6	14.79, Dec. 15
1931.	18.21, Jan. 7	15.90, Dec. 16
1930.	18.71, May 14	18.21, Dec. 17
1929.	18.59, Nov. 27	17.04, July 24

	HIGH	LOW
1939.	\$15.08, Feb. 21	\$14.875, Jan. 31
1938.	15.00, Nov. 22	11.00, June 7
1937.	21.92, Mar. 30	12.92, Nov. 10
1936.	17.75, Dec. 21	12.67, June 9
1935.	13.42, Dec. 10	10.33, Apr. 29
1934.	13.00, Mar. 13	9.50, Sept. 25
1933.	12.25, Aug. 8	6.75, Jan. 3
1932.	8.50, Jan. 12	6.43, July 5
1931.	11.33, Jan. 6	8.50, Dec. 29
1930.	15.00, Feb. 18	11.25, Dec. 9
1929.	17.58, Jan. 29	14.08, Dec. 3
1928.	16.50, Dec. 31	13.08, July 9

.. THIS WEEK'S MARKET NEWS ..

STEEL OPERATIONS

... Ingot output at 55½ per cent, highest of year thus far

ARISE of a point and a half in ingot production to 55½ per cent brings the industry to its highest activity of the year thus far.

Much of the improvement has taken place in the two major producing districts, PITTSBURGH and CHICAGO. The gain at PITTSBURGH is three points to 51 per cent and that at CHICAGO is two and a half points to 56 per cent. The WHEELING-WEIRTON area is up four points to 90 per cent, YOUNGSTOWN has gained two points to 47 per cent, and BUFFALO is up two and a half points to 32 per cent.

Losses have occurred at DETROIT, ST. LOUIS and in the CLEVELAND-LORAIN district. There has been a four-point drop at DETROIT to 75 per cent caused by the taking off of three open-hearth furnaces at the Ford plant. Great Lakes Steel is operating 12 of its 16 furnaces. The present rate at DETROIT is expected to continue for a few weeks and is regarded as an indication that steel inventories are at a relatively high level at DETROIT. The loss at ST. LOUIS is four points to 56 per cent and that in the CLEVELAND-LORAIN district is only one point to 50 per cent.

Along with the gain in ingot production at CHICAGO is a stepping up of pig iron output, Carnegie-Illinois Steel Corp. having blown in two additional furnaces, which brings the total of the company's active furnaces in the district to 11 out of 25.

PRICES

... Announcements expected this week ... Extras may be revised

WITH attention of the trade centered on the steel price structure, it is expected that formal second quarter price announcements will be made some time this week. It is likely that the quantity extra and deduction setup on hot and cold rolled sheets and strip and hot rolled bars will be revised to the extent that the maximum deduction of \$3 a ton will apply on 75 ton lots and over, instead of 150 ton and over as at present. The base price will probably apply on

minimum carload lots or less after the revision is in effect.

There is a distinct possibility that the base price of hot rolled sheets and strip will be adjusted upward slightly and, should such action occur, it would equalize the prices on the more common widths and gages of hot rolled single pickled annealed and cold rolled mill run sheets which at present are separated by a differential of \$2 a ton.

Owing to the present state of demand for steel products, it is anticipated that semi-finished steel, hot and cold rolled bar, structural shape and plate, cold rolled sheet and strip, and manufacturers wire prices will be reaffirmed for second quarter delivery. With tubular goods and merchant wire prices not subject to quarterly announcement, these items will continue on the "subject to change without notice" basis.

NEW BUSINESS

... Upward trend in orders expected during March

THE volume of new business at PITTSBURGH in February was not quite up to the total tonnage placed in January but producers expect a much better rate of activity in March. Clarifications of second quarter price adjustments will undoubtedly serve as an added impetus for a quickening pace in the rate of incoming business.

With current tonnage coming from widely diversified fields, Governmental factors clarified, and seasonal strengthening likely to be felt before long, CLEVELAND and YOUNGSTOWN steel producers are convinced the outlook for an uptrend is now brighter than at any time since late last fall. Demand for steel at CLEVELAND and YOUNGSTOWN, while light, has held up better than expected in recent weeks, considering all circumstances. In most products, February sales were comparable to those of January. Merchant wire products are becoming seasonally more active.

February generally was a better month than January in CHICAGO and in some cases considerable improvement was shown. Railroad buying was an important factor throughout

the month. The Illinois Central has ordered 8500 tons of rails. Implement and tractor production still is fairly good and further activity may be seen with the coming of spring. Shipments are still being made to motor car makers of tonnage purchased at low prices last fall.

The fifth section of the CHICAGO subway will require about 4700 tons of liner plates, 3650 tons of reinforcing bars, 140 tons of cast iron, 250 tons of shapes and 63,000 ft. of steel conduit. Bids will be taken March 9.

In the NEW YORK market, orders for several of the leading steel companies last week were the best of the year thus far. While some companies have noticed a steady, though small, gain each week since the first of the year, others have encountered a spotty situation.

PIG IRON

... Some producers may open books for second quarter this week

IT is reported that some pig iron producers will open their books this week for second quarter contracts, but no rush to cover is expected as a good many foundries still have iron due them on pending contracts. There is no indication of a change in prices for the second quarters.

A reduction of \$3 a ton on all grades of pig iron by Canadian prices is apparently a move to bring Dominion prices more nearly in line with prices that have been in effect in the United States for some time.

Shipments during February made slight gains in some districts and barely held their own against January in others. Daily shipments from CLEVELAND and YOUNGSTOWN furnaces held up to the daily average of January, but owing to the shorter month the February total did not equal that of January. Producers at PITTSBURGH look for somewhat better orders and shipments this month, but February did not bring a gain either in new business or deliveries over January. In the CHICAGO area February shipments, on a daily basis, were about equal to the January rate. In the NEW YORK district shipments are

gaining over the poor record of recent weeks, but bookings are light. In NEW ENGLAND such outstanding manufacturers as Niles-Bement-Pond Co., Brown & Sharpe Mfg. Co., General Electric Co. and Westinghouse Electric & Mfg. Co. have recently stepped up operations, giving rise to the hope among pig iron sellers that NEW ENGLAND pig iron buying will improve soon.

The Sharon Steel Corp.'s Mary furnace at Lowellville has been blown out.

PLATES

... Some improvement in orders in the Central territory

THERE has been some improvement in orders for plates in the Central States, but none of importance in the East, where mills report that February tonnage was less than that of January. Most of the orders in the East have resulted from ship-building work, both naval and commercial, recent specifications covering boilers as well as hull steel.

At CHICAGO plate tonnage has been somewhat higher than in previous weeks and there are indications that additional increases may be seen for the next several weeks. Contributing factors in the gain there are more structural fabrication because of improving weather conditions and several railroad car construction programs which are just getting underway.

There has also been some improvement at CLEVELAND and YOUNGSTOWN mills resulting from participation in a number of plate jobs. Crane manufacturers in Ohio are busier. Buying of 2000 tons of plates for a water pipe line at Toledo is expected soon.

At St. LOUIS car and tank builders have contributed to a somewhat better plate situation.

SEMI-FINISHED STEEL

... Little change noticed in volume of buying

TOTAL bookings in the past week at PITTSBURGH compared favorably with recent levels and little change in the buying trend is expected during the next few weeks. With no basic price changes there is no important incentive for consumers to make large forward purchases.

Market Sidelights

Work on Birmingham's new \$4,500,000 white low cost housing project was formally started on Feb. 20 when ground was broken by Nathan Straus, administrator of the Federal Housing Authority. While in Birmingham, Mr. Straus stated that approximately \$15,000,000 in additional funds would be earmarked for Birmingham if Congress passes the new slum clearance appropriation.

* * *

Hardie-Tynes Mfg. Co., Birmingham, has announced an order for 14 high pressure air compressors from the U. S. Navy Department for installations in Navy ships.

* * *

R. W. Kaltenbach Corp., Bedford, Ohio, has been awarded a \$324,750 contract for construction of three 50-ton drydock cranes for Navy yards in Boston, Philadelphia and Mare Island, Cal.

* * *

Goodyear Tire & Rubber Co., plans to spend approximately \$3,000,000 in modernization of its three Akron plants. A large portion of the program will be devoted to new machinery.

However, with stocks at a low point, non-integrated mills will continue to be a strong factor of support if the improvement in flat-rolled buying, anticipated by steel officials, takes place.

Effective Feb. 18, quantity base for tube rounds was set at 150 tons or over. Previously base had been 500 tons or more. Quantities of less than 150 tons are considered as being on the bar card.

STRUCTURAL STEEL

... 8600-ton award goes to American Bridge Co.

PRODUCERS are growing hopeful for increased activity as the winter months draw near an end. This past week American Bridge Co. was awarded 8600 tons for a Mississippi River bridge at Rock Island, Ill., while 2500 tons for du Pont buildings at Seaford, Del., went to Bethlehem Steel Co. and 1060 tons for the Norfolk & Western Railroad at Maybeury, W. Va., will be provided by Virginia Bridge Co., Roanoke, Va.

Inquiries are reported increasing at PITTSBURGH, where actual awards have been declining recently, and pending tonnages in the New York area, including 2200 tons for a Treas-

ury Department pier shed, and 3600 tons for another section of the Delaware aqueduct, have reached the highest level in some weeks. Six buildings for Celanese Corp. at Narrows, Va., will require 2000 tons (bids due March 7).

A proposed viaduct in CHICAGO will take 1700 tons of shapes. Cranes, gate hoists and other equipment this week brought business to the WEST COAST fabricators, where no new shape projects are reported.

RAILROAD BUYING

... Southern Pacific orders 40 locomotives costing \$7,250,000

THE first large order of the year for steam locomotives has been placed by the Southern Pacific. Forty engines to cost \$7,250,000 were ordered. The Baldwin Locomotive Works will build 28 oil burners for freight and passenger service and the Lima Locomotive Co. will build 12 coal burners. This leaves the inquiry of the Union Pacific for 15 locomotives as the largest pending purchase.

The Wabash has issued an inquiry for four 600-hp. diesel engines and 35 cabooses, and it has been authorized to apply friction truck springs to 556 box cars at a cost of \$340,272.

Other equipment inquiries include two mail-storage, two mail-baggage and eight passenger cars for the Missouri Pacific and an unstated number of diesel-electric locomotives for the Royal State Railways of Siam.

Recent equipment orders include 100 center-dump hopper cars for the Lehigh & New England, placed with the Bethlehem Steel Co.; three diesel-electric locomotives for the Ford Motor Co., awarded to the General Electric Co.; two 50-ton box cars for the Navy Department, awarded to the Greenville Steel Car Co., and two 50-ton flat cars for the Navy Department, awarded to the Magor Car Corp.

It is probable that the Maine Central will soon place 500 freight cars (the original inquiry called for 750) with the Bethlehem Steel Co. and the Magor Car Corp., application having been made to the Interstate Commerce Commission for permission to issue \$1,250,000 of trust certificates to pay for this new rolling stock. Its affiliated road, the Boston & Maine, may also buy up to 2000 box cars, but no formal action has been taken.

Rail orders are light this week. The Illinois Central has ordered 8500 tons, of which 4500 tons will be furnished by Carnegie-Illinois and 4000

tons by Inland. The Kansas, Oklahoma & Gulf is inquiring for 4400 tons of rails and the Richmond, Fredericksburg & Potomac will take 2300 tons soon.

Class I railroads on Feb. 1, this year, had 6637 new freight cars on order compared with 6563 on the same day in 1938, the Association of American Railroads has announced. On Jan. 1, this year, there were 5080 new freight cars on order. New steam locomotives on order on Feb. 1 totaled 25 compared with 110 on Feb. 1, last year. On Jan. 1, 1939, there were 30 on order. The railroads also had 59 new electric and diesel locomotives on order on Feb. 1 compared with 21 on Feb. 1, 1938. On Jan. 1, 1939, there were 41 on order.

WIRE PRODUCTS

... Producers expect greater activity in March and April

MERCHANT wire sales at PITTSBURGH and CLEVELAND have increased slightly within the past week and the same improved demand is reflected in the volume of manufacturers' wire specifications. Producers look for a higher rate of activity during March and April.

Demand from the wide consuming rural areas surrounding CHICAGO should become increasingly active from this time on through the spring months. At the same time, the expected spring pickup in industrial fields will affect manufacturers' wire, particularly those plants supplying motor car makers.

Inquiry for 2,800,000 ft. of 1/2-in. galvanized steel strand for overhead ground wire by the Los Angeles Department of Water and Power brought identical bids from nine suppliers. Manufacturers' demand is brisk.

BOLTS, NUTS, RIVETS

... Spring upturn in demand is expected soon

CLEVELAND reports that while incoming volume has tapered, producers of all lines continue optimistic for a spring upturn. Reports from the West are the most encouraging, farm equipment manufacturers in particular appearing to be in the market more liberally. In the East, hand-to-mouth buying prevails. Cap screw prices are reported spotty.

SHEETS AND STRIP

... Price announcements for second quarter may bring changes

PRICE announcements for the second quarter which are expected this week, are more likely to affect sheets and strip than other steel products. Details will be found under the heading "Prices."

Withdrawal by steel mills of the functional allowance to jobbers on galvanized flat sheets and formed roofing may result in an increased volume of ordering during March as many jobbers are protected under the old arrangement until the end of the quarter.

Orders for uncoated material may also be stimulated during March if the expected price changes offer sufficient inducement for speculative buying prior to the effective date of the changes, April 1.

The recent volume of orders for sheets and strip has been disappointing, having shown no gain. Producers at PITTSBURGH, however, look for greater activity this month, particularly from the automobile industry. Mills still have some low-priced business on their books.

WAREHOUSE BUSINESS

... February orders not satisfactory but March pickup is expected

TOTAL February business among jobbers at PITTSBURGH was little if any better than the volume taken in January, but there has been evidence recently of an increase in the number of customers. Demand is fairly well scattered over the list of products and warehouse interests are expecting a better rate of activity during March.

February business in CHICAGO warehouses, in spite of only 24 working days and two holidays, exceeded the same month last year by a comfortable margin. Sentiment is satisfactory and distribution of products continues wide and varied. Beginning March 15, a seasonal pickup is expected which may assume considerable proportions.

Despite slackened demand during the latter part of February, the

month's warehouse volume at CLEVELAND has been comparable to that of January. As to products, the movement is fairly evenly distributed.

In the Detroit area there has been slight pickup in volume during February. January business fell off less than was expected. Prospects for spring business are encouraging, with the realization that price cutting is diminishing. However, cold-finished bars, nominally 4.10c. per lb., base, are being sold at prices as low as 3.60c. in a highly competitive market.

February witnessed a slight improvement in warehouse business in Boston due in part to a feeling among a few consumers that prices are more likely to be higher than lower. Average individual orders, however, concern hand-to-mouth lots of products, which in the aggregate fell considerably under February, 1938, tonnages. Sentiment among warehousemen is that business will materially improve with warmer weather.

Warehousemen at Buffalo report a February more active than that of 1938. Increased tonnage reflects a greater number of orders. The whole market has taken on a more encouraging tone.

On a daily basis, business in the NEW YORK area in February was slightly better than in January. The light lines and specialties continue to account for the bulk of sales, with structural shapes and reinforcing bars the slowest moving items. The recent discontinuation of the jobbers' functional discount on galvanized sheets is expected eventually to strengthen the several weak spots which still exist in warehouse prices in that district, but as yet there has been no visible indication of this effect.

MERCHANT BARS

... Volume not much improved but diversification gains

DIVERSIFICATION in hot-rolled bar sales at PITTSBURGH continues to expand slowly and producers look for this trend to broaden perceptibly within the next month or so. Miscellaneous buyers are slightly more active and automobile and farm implement makers are taking moderate tonnages of bars.

Incoming orders at CLEVELAND have fallen off since the middle of February. The contraction is in line with general business conditions rather than

any special development among bar consumers.

CHICAGO mills are receiving most of their bar orders from forgers, cold drawers, and implement and tractor manufacturers. The latter two groups are moderately optimistic and expect increases soon. Orders for bars will increase considerably with additional automobile production.

REINFORCING BARS

... Awards hold, pending business still on downtrend

AWARDS are holding while inquiries continue to decline, with lettings in the New York area, for example, totaling only 500 tons. A St. Joseph, Mo., sewer will require 700 tons. A large tonnage of material is pending in the CHICAGO area. New business is lighter than expected at PITTSBURGH.

TIN PLATE

*... Business below expectations
... Operations slightly lower*

OPERATIONS this week are estimated at approximately 50 per cent, down about two points from last week's level. The slight drop is not considered significant but on the other hand incoming business has been somewhat below expectations recently. Producers are pinning their hopes for greater activity on March possibilities, especially since some commitments from can makers cannot long be delayed.

TUBULAR GOODS

... February orders did not equal January volume

FEBRUARY pipe orders were not quite up to January volume and current business has not made the strides producers had hoped for. Oil-country goods specifications continue to lag but demand for merchant pipe is increasing in line with better building activity. Inclement weather in the oil fields has hampered drilling.

IRON ORE

... January consumption of Lake ore 2,926,706 tons

BLAST furnaces consumed 2,926,706 gross tons of Lake Superior iron ore during January against 3,040,700 tons in December and 1,923,056 tons in January, 1938. Iron ore on hand at furnaces and Lake Erie docks Feb. 1 totaled 31,688,905 tons against 34,578,849 tons on Jan. 1 and 38,881,832 tons one year ago. There were 93 furnaces using Lake ore in blast Jan. 31, according to the Lake Superior Iron Ore Association.

Imports at Philadelphia

PHILADELPHIA—The following imports were received here during the past week: 1500 tons of chrome ore from South Africa; 100 tons of structural shapes, 41 tons of steel bars and 42 tons of steel bands from Belgium.

Armor Plate Awards Total \$24,000,000

WASHINGTON—The Navy Department on Tuesday announced awards approximating \$24,000,000 for armor plate. The percentages of the total amount going to each of the three armor plate manufacturers were given as follows—Bethlehem Steel Co., 42; Midvale Co., 33, and Carnegie-Illinois Steel Corp., 25. It is understood that the awards involved about 36,000 tons.

More Than 450 Tons of Steel In New TVA Generator

WHEN completed at the East Pittsburgh works of the Westinghouse Electric & Mfg. Co., the new 64,000 kva. hydroelectric generator being built for the Tennessee Valley Authority dam on the Hiwassee River in North Carolina will contain approximately 450 tons of steel and more than 50 tons of copper. Operated at its maximum capacity this generator, it is estimated, could produce enough power to supply the electrical needs of a city of 120,000. At its normal operating speed, 120 r.p.m., the periphery of the generator's 250 ton steel rotor will travel faster than 113 m.p.h. to generate 64,000 kva.

National Radiator Corp. has appointed the Eastern Steam Specialty Co., Inc., 125 Barclay Street, New York, as representative in the New York City area, and Faville-LeValley Corp., 140 S. Dearborn Street, Chicago, as representative in the Chicago area.

Weekly Bookings of Construction Steel

	Week Ended				Year to Date	
	Feb. 28, 1939	Feb. 21, 1939	Jan. 31, 1938	Mar. 1, 1938	1939	1938
Fabricated structural steel awards	19,400	13,500	22,450	6,900	176,500	101,075
Fabricated plate awards	195	2,555	10,755	3,960	28,450	22,675
Steel sheet piling awards	400	0	850	0	8,360	3,185
Reinforcing bar awards	3,650	3,100	21,515	2,160	86,545	39,580
Total Letting of Construction Steel..	23,645	19,155	55,570	13,020	299,855	166,515

FABRICATED STEEL

... Lettings advance to 19,400 tons from 13,500 tons last week . . . New projects slightly higher at 17,825 tons . . . Plate awards only 195 tons.

NORTH ATLANTIC STATES AWARDS

2500 Tons, Seaford, Del., buildings for E. I. du Pont de Nemours & Co., to Bethlehem Steel Co., Bethlehem, Pa.

460 Tons, Bronxville, N. Y., Colonial Court apartment building, to Grand Iron Works, Inc., New York.

390 Tons, Cato, N. Y., high school, to R. S. McMannus Steel Construction Co., Buffalo, through A. Friederich & Sons, Rochester, N. Y.

385 Tons, New York, laundry building, 514 West 49th Street, to Bethlehem Steel Co., Bethlehem, Pa.

200 Tons, Natick, Mass., manufacturing building for American Concrete & Steel Co., to New England Structural Co., Everett, Mass.

200 Tons, Ossining, N. Y., Park School, to Lehigh Structural Steel Co., Allentown, Pa., through William A. BerBusse, Inc., White Plains, N. Y.

175 Tons, Brighton, N. Y., high school building, to Leach Steel Corp., Rochester, N. Y.

THE SOUTH

1060 Tons, Maybeury, W. Va., Norfolk & Western Railroad bridge, to Virginia Bridge Co., Roanoke, Va.

590 Tons, Collingsworth County, Tex., bridge, to Illinois Steel Bridge Co., Jacksonville, Ill., through P. & B. Construction Co., Fort Worth, Tex.

580 Tons, Gregg County, Tex., bridge to Virginia Bridge Co., Roanoke, Va.

385 Tons, Caddo Parish, La., bridge, to Jones & Laughlin Steel Corp., Pittsburgh.

CENTRAL STATES

8600 Tons, Rock Island, Ill., Mississippi River bridge, to American Bridge Co., Pittsburgh.

958 Tons, State of Nebraska, Johnson Canyon power plant divided as follows:

760 Tons, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

198 Tons, to Lincoln Steel Works, Lincoln, Neb.

575 Tons, Kansas City, Mo., manufacturing buildings, Agar Mfg. Corp., to Kansas City Structural Steel Co., Kansas City, Kan.

550 Tons, Grand Rapids, Mich., press girders for press shop addition, Grand Rapids Stamping Division, General Motors Corp., to American Bridge Co., Pittsburgh.

540 Tons, Kent, Ohio, McGilvrey Hall, Kent State University, to Burger Iron Works, Akron, Ohio, through Carmichael Construction Co., Akron.

360 Tons, Council Bluffs, Iowa, train sheds, Union Pacific Railway Co., to Paxton & Vierling Iron Works, Omaha, Neb.

295 Tons, Youngstown, city hall, to Ohio Structural Steel Co., Newton Falls, Ohio, through Schirmer-Peterson Co., Cleveland.

140 Tons, Phalanx, Ohio, building for Industrial Silica Co., to Ohio Structural Steel Co., Newton Falls, Ohio.

100 Tons, Zanesville, Ohio, auditorium, to Truscon Steel Co., Youngstown.

WESTERN STATES

150 Tons, Santa Ana, Cal., service gates, frames and hoists for Prado Dam, to Phillips & Davies, Inc., Kenton, Ohio.

137 Tons, Santa Ana, Cal., spillway bridge for Prado Dam, to Consolidated Steel Corp., Los Angeles.

125 Tons, Odair, Wash., stop log guides, Grand Coulee Dam, to Schmitt Steel Co., Portland, Ore.

110 Tons, Crownover, Wash., gate hoists for Roza Dam, to Foote Brothers Gear & Machinery Corp., Chicago.

Unstated tonnage, Mare Island, Cal., and Bremerton, Wash., two 50-ton cranes for Navy, as follows: R. W. Kaltenbach, Bedford, Ohio (Item 5); Star Iron & Steel Co., Tacoma, Wash. (Item 6).

PENDING STRUCTURAL PROJECTS

NORTH ATLANTIC STATES

3600 Tons, Ulster County, N. Y., contract No. 316, Delaware aqueduct; bids received by Board of Water Supply, New York, until March 14.

2200 Tons, New York, pier shed, North River.

550 Tons, New York, central heating plant, Metropolitan Life Insurance Co.

400 Tons, Brooklyn, alterations, Elks Club.

400 Tons, Camden, N. J., sports auditorium, Crescent Auditorium Co.

400 Tons, Rome, N. Y., hospital building.

325 Tons, Fredonia, N. Y., school.

300 Tons, Hamburg, N. Y., school.

235 Tons, East Park, N. Y., Junior-Senior High School.

200 Tons, Cranford, N. J., apartment houses, English Village, Inc.

200 Tons, Fillmore, N. Y., school.

115 Tons, New York, service facilities, Henry Hudson Parkway.

115 Tons, New York, boiler sections, North Beach Airport.

100 Tons, Arlington-Sandgate, Vt., two State bridges.

100 Tons, Dorchester, Mass., Columbia Circle underpass.

Unstated tonnage, East Pembroke, N. Y., school; bids March 9.

SOUTH AND SOUTHWEST

2000 Tons, Narrows, Va., six buildings for Celanese Corp.; bids March 7.

550 Tons, Rutledge, Tex., trash rack metal work, Marshall Ford Dam.

450 Tons, Huntington, W. Va., East End High School.

Unstated tonnage, Engle, N. M., 40-ton crane for Bureau of Reclamation (Specifications 1200-D); bids March 16 at Denver.

CENTRAL STATES

1700 Tons, Chicago, viaduct, Western Avenue at 31st Street, bids June 1.

1000 Tons, E. Lansing, Mich., State College auditorium.

800 Tons, Riverview, Mich., addition to manufacturing building, Firestone Steel Products Co.

340 Tons, St. Louis, post office garage; J. S. Alberici, St. Louis, low bidder on general contract.

250 Tons, Chicago, fifth section, subway; bids March 9.

225 Tons, Comstock, Mich., turbine room framing, Consumers Power Co.

200 Tons, South Bend, Ind., high school; bids March 3.

115 Tons, Whiting, Ind., supports, Standard Oil Co.

WESTERN STATES

375 Tons, Grand Coulee Dam, Wash., trusses for supporting plates, Bureau of Mines.

300 Tons, Grace, Idaho, saddles for pipe line, Utah Power & Light Co.

135 Tons, Granby, Colo., bridges, Bureau of Reclamation.

125 Tons, Smithson, Cal., underpass, Bureau of Reclamation.

FABRICATED PLATES

AWARDS

195 Tons, Port Arthur, Tex., tanks for Gulf Oil Corp., to Wyatt Metal & Boiler Works, Dallas, Tex.

PENDING PROJECTS

2000 Tons, Toledo, waterworks pipe line; Jos. Kalil, Cleveland, low bidder on division A; Crumley, Jones & Crumley, Cincinnati, low bidders on division B (previously reported).

100 Tons, Bellingham, Mass., standpipe.

SHEET PILING

AWARDS

400 Tons, New York, municipal supply requirements, to Carnegie-Illinois Steel Corp., Pittsburgh.

FINANCIAL NOTES

Mesta Machine Co., reports a net income for 1938 of \$2,909,956 compared with a net income of \$4,668,029 in 1937. Unfilled orders at the close of 1938 amounted to \$7,832,525, compared with \$13,074,460 at the end of 1937.

Armstrong Cork Co. reports a net income for 1938 of \$1,150,795. "Despite the fact that certain of the most optimistic forecasts of business activity during 1939 have been tempered by recent events, it is evident that the major movement of business is toward higher levels," H. W. Prentiss, Jr., president, said.

General Steel Castings Corp., Granite City, Ill., reported a net loss of \$1,808,693 for 1938 against net income of \$490,752 for 1937.

Pittsburgh Steel Co. has reported a net loss for the year 1938 of \$778,509, but because of a change in practice from a fiscal year policy to a calendar year report, a special charge-off of \$97,978 which ordinarily would have been deducted between January and June, 1939, has been incorporated in a recent report for the year ending 1938. Without this special deduction, net loss for 1938 would have been \$680,531.

Superior Steel Corp., Carnegie, Pa., reports a net loss of \$291,674 for 1938. According to Frank R. Frost, president, the company showed a net profit in the final quarter of 1938 and indications are favorable, based upon profitable operations in January.

Woodward Iron Co., Woodward, Ala., had net earnings of \$532,880.65 in 1938. Gross earnings, before depreciation, depletion, etc., were \$2,403,708.35. In 1938 sales, less discounts, returns and allowances, amounted to \$6,922,560.33, as compared with \$9,237,623.16 in 1937. Net earnings for the year amounted to \$1.97 per common share. Funded debt was reduced during the year by \$378,400.

International Harvester Co., realized net profits in 1938 of \$18,472,000 as compared with \$32,493,000 in the previous 12 months. Domestic sales dropped from \$270,254,000 in 1937 to \$196,900,000 last year.

... NON-FERROUS ...

... Sentiment is more optimistic, but turnover is little changed ... Spelter backlog lowest since June, 1937 ... Lead demand continues active.

NEW YORK, Feb. 28—The more conciliatory attitude lately evidenced toward business by the New Deal has created a more optimistic sentiment with regard to future prospects in the non-ferrous markets. Consumers, however, are refraining from translating this feeling

into purchases until they are certain that this new attitude is a definite indication of what the Administration's actions in the future will be. This anomalous situation has brought small improvements in both the foreign copper price and the domestic open market price, but has had no effect on

sales. In the open market business has been done recently at 10.50c. per lb., while in the foreign market several lots have been lately sold at as high as 10.10c. per lb., c.i.f. Domestic producers' quotations meanwhile remain unchanged at 11.25c. per lb., Connecticut Valley. Foreign copper output, according to an announcement made last week, has been lowered to 95 per cent of standard tonnages, a reduction of five points.

Lead

The demand for lead in the past week was quite strong, with the sheet, pipe and oxide makers particularly active. Sales amounted to 10,000 tons, of which about 60 per cent was for March delivery, as against 7000 in the previous week. The firmer tendencies of the London price, which today is 2.98c. per lb. on spot, is credited with causing many consumers to cover in haste, anticipating a move to higher levels in the domestic price if the recent advances of the London quotation continue. Domestic sellers' quotations are unchanged at 4.75c. per lb., New York.

Zinc

The spelter market was featureless all week, with the sales volume little changed from the previous week. The rate at which shipments are going forth remains the only bright spot in the market. Little change is expected in the market here until some definite trend develops abroad, and both consumers and sellers are meanwhile marking time. Prime Western sales last week were 1176 tons against 1471 in the previous week and shipments were 3700 tons against 3718. Unfilled orders at the end of the week totaled 26,820 tons, the lowest weekly figure since the end of June, 1937. Domestic quotations are firm and unchanged at 4.89c. per lb., New York.

Tin

Straits prices moved slightly higher during the past week in sympathy with the better tone in the stock market and the expectation that production quotas will be reduced further when the control committee meets on March 22, but turnover was very small, being limited to occasional five ton lots. Carload business was practically nonexistent. Straits metal today is quoted at 46c. per lb., New York, a gain of 60 points over Tuesday a week ago. On first call in London this morning cash standards were £213 10s., which is almost identical to the price prevailing there a week ago.

NON-FERROUS PRICES

Cents per lb. for early delivery

	Feb. 23	Feb. 24	Feb. 25	Feb. 27	Feb. 28
Copper, Electrolytic ¹	11.25	11.25	11.25	11.25	11.25
Copper, Lake	11.375	11.375	11.375	11.375	11.375
Tin, Straits, New York	45.40	45.55	45.70	46.00
Zinc, East St. Louis ²	4.50	4.50	4.50	4.50	4.50
Lead, St. Louis ³	4.60	4.60	4.60	4.60	4.60

¹ Delivered Conn. Valley, deduct ¼c. for New York delivery. ² Add 0.39c. for New York delivery. ³ Add 0.15c. for New York delivery.

Warehouse Prices

Base per lb., Delivered

	New York	Cleveland
Tin, Straits pig	46.75c.	47.85c.
Copper, Lake	12.25c.	12.375c.
Copper, electro	11.50c.	12.375c.
Copper, castings	11.25c.	11.875c.
*Copper sheets, hot-rolled	19.375c.	19.375c.
*High brass sheets	17.31c.	17.31c.
*Seamless brass tubes	20.06c.	20.06c.
*Seamless copper tubes	19.875c.	19.875c.
*Brass rods	12.62c.	12.62c.
Zinc slabs	6.25c.	7.00c.
Zinc sheets, No. 9 casks	10.50c.	12.10c.
Lead, American pig	5.75c.	5.50c.
Lead, bar	6.275c.	8.25c.
Lead, sheets, cut	8.00c.	8.00c.
Antimony, Asiatic	15.00c.	17.00c.
Alum., virgin, 99 per cent plus	22.50c.	22.50c.
Alum., No. 1 remelt, 98 to 99 per cent	19.50c.	19.50c.
Solder, ½ and ½	28.125c.	28.625c.
Babbitt metal, commercial grade	21.50c.	20.75c.

* These prices, which are also for delivery from Chicago warehouses, are quoted with the following percentages allowed off for extras: on copper sheets, 33 1/3; on brass sheets and rods, 40, and on brass and copper tubes, 25.

Old Metals Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators. Selling prices are those charged to consumers after the metal has been prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible ..	8.00c.	8.75c.
Copper, hvy. and wire ..	7.00c.	7.50c.
Copper, light and bot-toms	6.25c.	6.50c.
Brass, heavy	4.25c.	4.75c.
Brass, light	3.375c.	4.125c.
Hvy. machine composition	6.125c.	7.625c.
No. 1 yel. brass turnings ..	4.125c.	4.625c.
No. 1 red brass or compos. turnings	5.875c.	6.50c.
Lead, heavy	3.625c.	4.50c.
Cast aluminum	7.00c.	8.25c.
Sheet aluminum	11.75c.	13.25c.
Zinc	2.25c.	3.50c.

Miscellaneous Non-Ferrous Prices

ALUMINUM, delivered; virgin 99 per cent plus, 20c.-21c. a lb.; No. 12 remelt, No. 2 standard, 19c.-19.50c. a lb. NICKEL, electrolytic, 35c.-36c. a lb. base refinery, lots of 2 tons or more. ANTIMONY, prompt, New York; Asiatic, 14c. a lb., f.o.b.; American, 11.25c. a lb. QUICK-SILVER, \$90-\$93 per flask of 76 lb. BRASS INGOTS, commercial 85-5-5-5, 10.50c. a lb. lcl.

IRON AND STEEL SCRAP

... Trading quiet in most districts ... Composite unchanged at \$15.08.

FEB. 28—Optimism as to the future is expressed by dealers and brokers throughout the country as steel mill operations rise, but practically no sale into consumption of any importance is reported. The few transactions in the important consuming centers have been in line with previously quoted prices. THE IRON AGE composite price for No. 1 heavy melting steel is unchanged from last week at \$15.08. Cast grades are stronger at DETROIT largely due to the seasonal demand of the automotive die shops which are ordering castings for 1940 model tools. Railroad items, on the other hand, are much softer at ST. LOUIS, following a substantial sale of No. 2 steel there the week before. Dealers' buying prices for railroad specialties are anywhere from 25c. to \$1.50 a ton lower.

Export buying prices are slightly stronger at Boston.

Pittsburgh

The market undertone continues steady with factors of strength being supplied by competitive broker bidding on No. 1 heavy melting steel. No. 1 steel remains quotable this week at \$15.50 to \$16, which range represents broker purchases as well as small consumer sales. Some clarification may be forthcoming after closing of railroad lists this week.

Chicago

A mill sale last week at \$14.50 establishes this market definitely at the \$14 to \$14.50 level. Brokers are paying not in excess of \$14 for steel from dealers. Some agitation is being heard for a lower heavy melting price, but additional profit in covering on the above mentioned sale is obviously being sought. Activity may be light here for the next month at least, as the leading buyer over the past year or two is not expected to be active for at least that long. Other mills in the district, however, have not purchased old material for some time, and one can reasonably be expected to enter the market at any time.

Philadelphia

Dealers here for the most part profess greater optimism, but this feeling is based primarily on hopes for the future rather than on volume of business passing through yards currently. Mills are still showing no desire to place new orders, and shipments on old orders are spotty and in poor volume. The price structure, however, is showing no weakness, although there really is little tonnage to test the list adequately. Two boats are loading at Port Richmond, and another is expected within the fortnight.

Buying for export, however, is not so active as it was several weeks ago, as brokers are finding it more profitable to accumulate export tonnages in other sections of the country. The Budd list of 3400 tons of bundles was bid in yesterday, and from information available it seems that the tonnage probably went to a broker at a price little if any better than that of last month.

Cleveland

Shipments are going forward against old orders here but new material is scarce. This week major quotations continue unchanged.

Youngstown

Scrap here is not coming out freely. During the past week supplies of some of the secondary grades have become noticeably more scarce. Little change in published quotations is expected until after the monthly railroad lists are out of the way. Rumors which gained ground recently that one of the large independent steel producers had bought in the open market, are officially denied. Although special lots have been purchased from industry, the company in question has made no open market purchases except turnings since July, 1937.

Buffalo

Some No. 2 material is being admitted on old orders but there are no new sales reported this week. The market is holding its own and resisting any efforts of consumers to buy at lower levels. At present rate of operations dealers can see nothing in immediate prospect but are not unduly disturbed. Cast scrap is moving out in odd carloads.

St. Louis

The scrap iron market is weaker and dealers prices lower following heavy offerings No. 2 heavy melting. Nos. 1 and 2 heavy wrought and railroad malleable are 25c. a ton lower; No. 1 locomotive tires and rails for rolling, 50c. off; heavy turnings and steel angle bars, \$1 less, and railroad springs, \$1.50 less. Railroad lists: Pennsylvania, 21,615 tons; Baltimore & Ohio, 4000 tons; Chicago, Milwaukee, St. Paul & Pacific, 2000 tons; and Missouri Pacific, 900 tons.

Cincinnati

The old materials market is at an impasse. Dealers hold material for better prices, but refuse to raise bids on available material. Some scrap continues to move to the leading district interest under its continuing contract, while other mills are not active in the market for scrap.

Boston

Exporters in some instances are paying 25c. a ton more for Nos. 1 and 2 steel, \$14.25 and \$13.25 a ton delivered

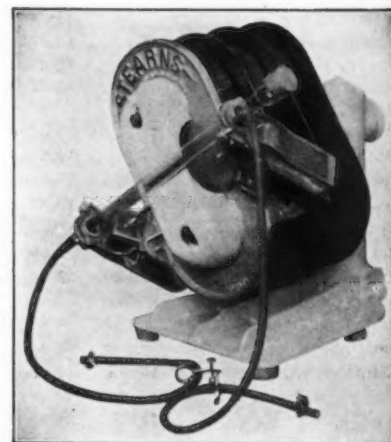
dock, but some business was put through the past week at \$14 and \$13 respectively. A steamer with 4000 tons for Italy sailed from here the past week. Another boat is scheduled to arrive this week to load. Brokers and yards heretofore contracting with the American Steel & Wire Co., Worcester, for heavy melting steel tonnages have not in all instances completed shipments. The company is making no new purchases. The Washburn Wire Co., Phillipsdale, R. I., has practically filled its steel requirements, paying \$14.50 a ton delivered for No. 1, and \$13.50 for No. 2. Brokers early the past week received offers of \$9 a ton for bound wire, and later \$9.25 from Pittsburgh district brokers figuring on a \$15.50 a ton basis, the equivalent of \$16 a ton for No. 1 heavy melting steel.

Detroit

Increased foundry activity generated by the release of automotive die work is the outstanding feature this week in an otherwise dull market. No. 1 machinery cast is bringing prices up to \$13 per net ton, accounting for the upward boost in the quoted range of \$13.50 to \$14 per gross ton. Automotive cast and heavy breakable cast have shown similar increases, with dealers offering higher prices to get this material for their yards. The closing of many automotive lists in the first half of the week indicated that prices on most items were in line with those obtained a month ago on comparable lists.

New York

Market conditions are firm and there is no change in broker buying prices either for domestic or foreign shipment.



RAPID determination of magnetic values in various ore slurry can be made with a new vibro-magnetic analyzer, made by Stearns Magnetic Mfg. Co., Milwaukee. The unit consists principally of a powerful d.c. magnet and a magnetically vibrated test tube suitably located with respect to the poles, all mounted on a roller bearing pivot to permit tilting of the assembly to any plane. Vibration amplitude can be varied up to 3/16 in. Concentrate samples containing up to 1 gm. weight of magnetic material can be accommodated. Pedestal base is supported on live rubber insulators.

Iron and Steel Scrap Prices

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. mtng. steel.	\$15.50 to \$16.00
Railroad hvy. mtng.	16.25 to 16.75
No. 2 hvy. mtng. steel.	14.25 to 14.75
Scrap rails	16.50 to 17.00
Rails 3 ft. and under	18.00 to 18.50
Comp. sheet steel	15.50 to 16.00
Hand bundled sheets	14.50 to 15.00
Hvy. steel axle turn	14.00 to 14.50
Machine shop turn	10.00 to 10.50
Short shov. turn	10.50 to 11.00
Mixed bor. & turn	8.50 to 9.00
Cast iron borings	8.50 to 9.00
Cast iron carwheels	15.00 to 15.50
Hvy. breakable cast	12.50 to 13.00
No. 1 cupola cast	15.25 to 15.75
RR. knuckles & cplrs.	17.50 to 18.00
Rail coil & leaf springs	18.00 to 18.50
Rolled steel wheels	18.00 to 18.50
Low phos. billet crops	18.50 to 19.00
Low phos. punchings	17.50 to 18.00
Low phos. plate	17.00 to 17.50

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. mtng. steel.	\$15.00 to \$15.50
No. 2 hvy. mtng. steel.	13.00 to 13.50
Hydraulic bund., new	14.50 to 15.00
Hydraulic bund., old	11.50 to 12.00
Steel rails for rolling	17.00 to 17.50
Cast iron carwheels	16.50 to 17.00
Hvy. breakable cast	15.50 to 16.00
No. 1 cast	16.50 to 17.00
Stove plate (steel wks.)	13.00 to 13.50
Railroad malleable	15.50 to 16.00
Machine shop turn	8.50 to 9.00
No. 1 blast furnace	6.50 to 7.00
Cast borings	6.50 to 7.00
Heavy axle turnings	10.00 to 10.50
No. 1 low phos. hvy.	17.00
Couplers & knuckles	17.00
Rolled steel wheels	17.00
Steel axles	20.00 to 20.50
Shafting	20.50 to 21.00
Spec. iron & steel pipe	12.00 to 12.50
No. 1 forge fire	11.00 to 11.50
Cast borings (chem.)	9.50 to 10.00

CHICAGO

Delivered to Chicago district consumers:

Per Gross Ton	
Hvy. mtng. steel	\$14.00 to \$14.50
Auto. hvy. mtng. steel alloy free	12.50 to 13.00
No. 2 auto steel	11.50 to 12.00
Shovelling steel	14.00 to 14.50
Factory bundles	13.00 to 13.50
Dealers' bundles	12.50 to 13.00
Drop forge flashings	10.50 to 11.00
No. 1 busheling	12.50 to 13.00
No. 2 busheling, old	5.75 to 6.25
Rolled carwheels	15.00 to 15.50
Railroad tires, cut	15.00 to 15.50
Railroad leaf springs	15.25 to 15.75
Steel coup. & knuckles	14.50 to 15.00
Axle turnings	12.50 to 13.00
Coil springs	16.00 to 16.50
Axle turn. (elec.)	13.50 to 14.00
Low phos. punchings	15.50 to 16.00
Low phos. plates 12 in. and under	15.00 to 15.50
Cast iron borings	5.25 to 5.75
Short shov. turn	7.00 to 7.50
Machine shop turn	6.50 to 7.00
Rerolling rails	16.75 to 17.25
Steel rails under 3 ft.	15.75 to 16.25
Steel rails under 2 ft.	16.25 to 16.75
Angle bars, steel	15.25 to 15.75
Cast iron carwheels	12.25 to 12.75
Railroad malleable	15.00 to 15.50
Agric. malleable	11.25 to 11.75

Per Net Ton

Iron car axles	\$18.50 to \$19.00
Steel car axles	18.00 to 18.50
Locomotive tires	14.00 to 14.50
Pipes and flues	9.00 to 9.50
No. 1 machinery cast	12.50 to 13.00
Clean auto. cast	13.00 to 13.50
No. 1 railroad cast	11.00 to 11.50
No. 1 agric. cast	10.25 to 10.75
Stove plate	7.75 to 8.25
Grate bars	9.00 to 9.50
Brake shoes	9.25 to 9.75

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. mtng. steel.	\$15.50 to \$16.00
No. 2 hvy. mtng. steel.	14.25 to 14.75
Low phos. plate	16.00 to 16.50
No. 1 busheling	14.50 to 15.00
Hydraulic bundles	15.00 to 15.50
Machine shop turn	9.75 to 10.25

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. mtng. steel.	\$14.00 to \$14.50
No. 2 hvy. mtng. steel.	13.00 to 13.50
Comp. sheet steel	13.50 to 14.00
Light bund. stampings	10.75 to 11.25
Drop forge flashings	13.00 to 13.50
Machine shop turn	7.50 to 8.00
Short shov. turn	8.00 to 8.50
No. 1 busheling	13.50 to 14.00
Steel axle turnings	11.50 to 12.00
Low phos. billet and bloom crops	18.00 to 18.50
Cast iron borings	8.00 to 8.50
Mixed bor. & turn	8.00 to 8.50
No. 2 busheling	8.00 to 8.50
No. 1 cupola cast	16.50 to 17.00
Railroad grate bars	9.50 to 10.00
Stove plate	9.50 to 10.00
Rails under 3 ft.	17.75 to 18.25
Rails for rolling	17.00 to 17.50
Railroad malleable	15.50 to 16.00
Cast iron carwheels	14.50 to 15.00

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. mtng. steel.	\$14.00 to \$14.50
No. 2 hvy. mtng. steel.	12.00 to 12.50
Scrap rails	15.00 to 15.50
New hvy. b'ndled sheets	12.00 to 12.50
Old hydraulic bundles	10.75 to 11.25
Drop forge flashings	12.00 to 12.50
No. 1 busheling	12.00 to 12.50
Hvy. axle turnings	10.50 to 11.00
Machine shop turn	6.50 to 7.00
Knuckles & couplers	16.50 to 17.00
Coil & leaf springs	16.50 to 17.00
Rolled steel wheels	16.00 to 16.50
Low phos. billet crops	15.50 to 16.00
Shov. turnings	8.75 to 9.25
Mixed bor. & turn	7.50 to 8.00
Cast iron borings	7.50 to 8.00
Steel car axles	16.50 to 17.00
No. 1 machinery cast	15.00 to 16.00
No. 1 cupola cast	14.50 to 15.00
Stove plate	13.00 to 13.50
Steel rails under 3 ft.	18.00 to 18.50
Cast iron carwheels	13.50 to 14.00
Railroad malleable	15.00 to 15.50
Chemical borings	9.00 to 9.50

ST. LOUIS

Dealers' buying prices per gross ton delivered to consumer:

Selected hvy. melting	\$12.50 to \$13.00
No. 1 hvy. melting	12.50 to 13.00
No. 2 hvy. melting	12.00 to 12.50
No. 1 locomotive tires	13.00 to 13.50
Misc. stand. sec. rails	13.75 to 14.25
Railroad springs	14.00 to 14.50
Bundled sheets	7.50 to 8.00
No. 1 busheling	7.50 to 8.00
Cast. bor. & turn	2.50 to 3.00
Machine shop turn	4.00 to 4.50
Heavy turnings	9.00 to 9.50
Rails for rolling	16.00 to 16.50
Steel car axles	17.00 to 17.50
No. 1 RR. wrought	10.25 to 10.75
No. 2 RR. wrought	12.00 to 12.50
Steel rails under 3 ft.	16.00 to 16.50
Steel angle bars	14.00 to 14.50
Cast iron carwheels	14.50 to 15.00
No. 1 machinery cast	14.50 to 15.00
Railroad malleable	12.25 to 12.75
No. 1 railroad cast	12.50 to 13.00
Stove plate	8.50 to 9.00
Grate bars	9.00 to 9.50
Brake shoes	10.00 to 10.50

CINCINNATI

Dealers' buying prices per gross ton at yards:

No. 1 hvy. mtng. steel.	\$11.50 to \$12.00
No. 2 hvy. mtng. steel.	9.25 to 9.75
Scrap rails for mtng.	15.25 to 15.75
Loose sheet clippings	6.75 to 7.25
Hydrau. b'ndled sheets	11.00 to 11.50
Cast iron boring	3.50 to 4.00
Machine shop turn	5.25 to 5.75
No. 1 busheling	8.00 to 8.50
No. 2 busheling	2.75 to 3.25
Rails for rolling	17.50 to 18.00
No. 1 locomotive tires	14.25 to 14.75
Short rails	18.00 to 18.50
Cast iron carwheels	12.75 to 13.25
No. 1 machinery cast	13.50 to 14.00
No. 1 railroad cast	12.75 to 13.25
Burnt cast	6.75 to 7.25
Stove plate	6.75 to 7.25
Agricul. malleable	11.75 to 12.25
Railroad malleable	14.25 to 14.75
Mixed hvy. cast	10.50 to 11.00

BIRMINGHAM

Per gross ton delivered to consumer:

Hvy. melting steel	\$12.50 to \$14.00
Scrap steel rails	14.50 to 15.00
Short shov. turnings	7.50 to 8.10
Stove plate	9.00 to 10.00
Steel axles	15.00 to 16.00
Iron axles	15.00 to 16.00
No. 1 RR. wrought	10.00
Rails for rolling	16.00 to 16.50
No. 1 cast	14.50
Tramcar wheels	14.00

DETROIT

Dealers' buying prices per gross ton:

No. 1 hvy. mtng. indus-trial steel	\$10.50 to \$11.00
No. 2 hvy. mtng. steel	9.00 to 9.50
Borings and turnings	5.75 to 6.25
Long turnings	5.50 to 6.00
Short shov. turnings	6.00 to 6.50
No. 1 machinery cast	13.50 to 14.00
Automotive cast	13.75 to 14.25
Hvy. breakable cast	10.00 to 10.50
Hydraul. comp. sheets	11.75 to 12.25
Stove plate	8.00 to 8.50
New factory bushel	10.75 to 11.25
Sheet clippings	8.25 to 9.25
Flashings	9.50 to 10.00
Low phos. plate scrap	11.50 to 12.00

NEW YORK

Dealers' buying prices per gross ton on cars:

No. 1 hvy. mtng. steel.	\$10.50 to \$11.00
No. 2 hvy. mtng. steel	9.00 to 9.50
Hvy. breakable cast	11.50 to 12.00
No. 1 machinery cast	11.50 to 12.00
No. 2 cast	9.50 to 10.00
Stove plate	9.50 to 10.00
Steel car axles	20.00 to 20.50
Shafting	15.50 to 16.00
No. 1 RR. wrought	11.00 to 11.50
No. 1 wrought long	9.50 to 10.00
Spec. iron & steel pipe	9.00 to 9.50
Rails for rolling	16.00 to 16.50
Clean steel turnings*	4.00 to 4.50
Cast borings*	3.50 to 4.00
No. 1 blast furnace	3.50 to 4.00
Cast borings (chem.)	9.50 to 10.00
Unprepared yard scrap	6.00 to 6.50
Light iron	3.00 to 3.50
Per gross ton, delivered local foundries:	
No. 1 machn. cast†	\$13.50 to \$14.00
No. 2 cast†	10.50 to 11.00

* \$1.50 less for truck loads.
† Northern N. J. prices are \$2 to \$2.50 higher.

BOSTON

Dealers' buying prices per gross ton:

No. 1 hvy. mtng. steel	Nominal
Scrap rails	Nominal
No. 2 steel	Nominal
Breakable cast	\$10.15
Machine shop turn	\$3.38 to \$4.15
Mixed bor. & turn	\$2.00 to 2.25
Bun. skeleton long	8.00 to 8.15
Shafting	15.50 to 15.65
Cast bor. chemical	4.50 to 5.00
Per gross ton delivered consumers' yards:	
Textile cast	\$12.50 to \$14.00
No. 1 machine cast	12.50 to 14.00

PACIFIC COAST

Per gross ton delivered to consumer:

No. 1 hvy. mtng. steel.	\$12.50 to \$14.00
No. 2 hvy. mtng. steel.	11.50 to 13.00

CANADA

Dealers' buying prices at their yards, per gross ton:

Toronto Montreal	
No. 1 hvy. mtng. steel.	\$9.75 \$9.25
No. 2 hvy. mtng. steel.	8.25 7.75
Mixed dealers steel	7.00 6.50
Drop forge flashings	10.00 9.50
New loose clippings	4.50 4.00
Busheling	4.25 3.75
Scrap pipe	5.50 5.00
Steel turnings	5.00 4.50
Cast borings	3.75 3.25
Machinery cast	15.00 14.00
Dealers cast	13.00 12.00
Stove plate	11.00 10.00

EXPORT

Dealers' buying prices per gross ton:

New York, truck lots, delivered, barges	
No. 1 hvy. mtng. steel.	\$12.00 to \$12.50
No. 2 hvy. mtng. steel.	10.50 to 11.00
No. 2 cast	10.50 to 11.00
Stove plate	9.50 to 10.00
Boston on cars at Army Base or Mystic Wharf	
No. 1 hvy. mtng. steel.	\$14.00 to \$14.25
No. 2 hvy. mtng. steel.	13.00 to 13.25
Rails (scrap)	14.00 to 14.25
Mixed textile and machinery cast	12.00
Philadelphia, delivered alongside boats, Port Richmond	
No. 1 hvy. mtng. steel.	\$14.50 to \$15.00
No. 2 hvy. mtng. steel.	13.50 to 14.00

PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

(Prices are f.o.b. unless otherwise indicated)

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point (Rerolling only). Prices delivered Detroit are \$2 higher. F.o.b. Duluth, billets only, \$2 higher.

Per Gross Ton

Rerolling\$34.00
Forging quality 40.00

Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

Per Gross Ton

Open hearth or bessemer\$34.00

Skelp

Pittsburgh, Chicago, Youngstown, Coatesville, Pa., Sparrows Point, Md.

Per Lb.

Grooved, universal and sheared1.90c.

Wire Rods

(No. 5 to 9/32 in.)

Per Gross Ton

Pittsburgh, Chicago or Cleveland\$43.00
Worcester, Mass. 45.00
Birmingham 43.00
San Francisco 52.00
Rods over 9/32 in. or 47/64 in., inclusive, \$5 a ton over base.

SOFT STEEL BARS

Base per Lb.

Pittsburgh, Chicago, Gary, Cleveland, Buffalo and Birmingham 2.25c.
Detroit, delivered 2.35c.
Duluth 2.35c.
Philadelphia, delivered 2.57c.
New York 2.59c.
On cars dock Gulf ports 2.60c.
On cars dock Pacific ports 2.85c.

RAIL STEEL BARS

(For merchant trade)

Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham 2.10c.
On cars dock Tex. Gulf ports 2.45c.
On cars dock Pacific ports 2.70c.

BILLET STEEL REINFORCING BARS

(Straight lengths as quoted by distributors)

Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Cleveland, Youngstown or Sparrows Pt. 1.90c. to 2.05c.
Detroit, delivered 2.00c. to 2.15c.
On cars dock Tex. Gulf ports 2.25c. to 2.40c.
On cars dock Pacific ports 2.50c.

RAIL STEEL REINFORCING BARS

(Straight lengths as quoted by distributors)

Pittsburgh, Chicago, Gary, Buffalo, Cleveland, Youngstown or Birmingham 1.75c. to 1.90c.
Detroit, delivered 1.85c. to 2.00c.
On cars dock Tex. Gulf ports 2.10c. to 2.25c.
On cars dock Pacific ports 2.35c.

Prices on reinforcing bars have been subject to concessions of \$3 a ton or more from above quotations.

IRON BARS

Chicago and Terre Haute 2.15c.
Pittsburgh (refined) 3.60c.

COLD FINISHED BARS AND SHAFTING*

Base per Lb.

Pittsburgh, Buffalo, Cleveland, Chicago and Gary 2.70c.
Detroit 2.75c.

* In quantities of 10,000 to 10,999 lb.

PLATES

Base per Lb.

Pittsburgh, Chicago, Gary, Birmingham, Sparrows Point, Cleveland, Youngstown, Coatesville, Claymont, Del. 2.10c.
Philadelphia, del'd 2.15c.
New York, del'd 2.29c.
On cars dock Gulf ports 2.45c.
On cars dock Pacific ports 2.60c.
Wrought iron plates, P't'g. 3.80c.

FLOOR PLATES

Pittsburgh or Chicago 3.35c.
New York, del'd 3.71c.
On cars dock Gulf ports 3.70c.
On cars dock Pacific ports 3.95c.

STRUCTURAL SHAPES

Base per Lb.

Pittsburgh, Chicago, Gary, Buffalo, Bethlehem or Birmingham 2.10c.
Philadelphia, del'd 2.215c.
New York, del'd 2.27c.
On cars dock Gulf ports 2.45c.
On cars dock Pacific ports 2.70c.

STEEL SHEET PILING

Base per Lb.

Pittsburgh, Chicago or Buffalo 2.40c.
On cars dock Gulf ports 2.85c.
On cars dock Pacific ports 2.90c.

RAILS AND TRACK SUPPLIES

F.o.b. Mill

Standard rails, heavier than 60 lb., per gross ton\$40.00
Angle bars, per 100 lb. 2.70

F.o.b. Basing Points

Light rails (from billets) per gross ton\$40.00
Light rails (from rail steel) per gross ton 39.00

Base per Lb.

Cut spikes 3.00c.
Screw spikes 4.55c.
Tie plates, steel 2.15c.
Tie plates, Pacific Coast ports. 2.25c.
Track bolts, to steam railroads 4.15c.
Track bolts to jobbers, all sizes (per 100 counts) 65-5

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa., Buffalo; on spikes alone, Youngstown, Lebanon, Pa., Richmond, Va.

SHEETS

Hot Rolled

Base per Lb.

Pittsburgh, Gary, Birmingham, Buffalo, Sparrows Point, Cleveland, Youngstown, Middletown or Chicago 2.15c.
Detroit, delivered 2.25c.
Philadelphia, delivered 2.32c.
Granite City 2.25c.
On cars dock Pacific ports 2.65c.
Wrought iron, Pittsburgh 4.25c.

Cold Rolled*

Pittsburgh, Gary, Buffalo, Youngstown, Cleveland, Middletown or Chicago 3.20c.
Detroit, delivered 3.30c.
Granite City 3.30c.
Philadelphia, delivered 3.52c.
On cars dock Pacific ports 3.30c.

* Mill run sheets are 10c. per 100 lb. less than base; and primes only, 25c. above base.

Galvanized Sheets, 24 Gage

Pittsburgh, Chicago, Gary, Sparrows Point, Buffalo, Middletown, Youngstown or Birmingham 3.50c.
Philadelphia, del'd 3.67c.
Granite City 3.60c.
On cars dock Pacific ports 4.00c.
Wrought iron Pittsburgh 6.10c.

Electrical Sheets

(F.o.b. Pittsburgh)

Base per Lb.

Field grade 3.20c.
Armature 3.55c.
Electrical 4.05c.
Special Motor 4.95c.
Special Dynamo 5.65c.
Transformer 6.15c.
Transformer Special 7.15c.
Transformer Extra Special 7.65c.

Silicon Strip in coils—Sheet price plus silicon sheet extra width extra plus 25c. per 100 lb. for coils. Pacific ports add 70c. a 100 lb.

Long Ternes

No. 24 unassorted 8-lb. coating f.o.b. Pittsburgh or Gary 3.95c.
F.o.b. cars dock Pacific ports. 4.65c.

Vitreous Enameling Stock, 20 Gage*

Pittsburgh, Chicago, Gary, Youngstown, Middletown or Cleveland 3.35c.
Detroit, del'd 3.45c.
Granite City 3.45c.
On cars dock Pacific ports 3.95c.

TIN MILL PRODUCTS

*Tin Plate

Per Base Box

Standard cokes, Pittsburgh, Chicago and Gary\$5.00
Standard cokes, Granite City... 5.10

* Prices effective Nov. 10 on shipments through first quarter of 1939.

Special Coated Manufacturing Ternes

Per Base Box

Granite City\$4.40
Pittsburgh or Gary 4.30

Roofing Ternes Plate

(F.o.b. Pittsburgh)

(Per Package, 112 sheets, 20 x 28 in.)
8-lb. coating I.C.\$12.00
15-lb. coating I.C. 14.00
20-lb. coating I.C. 15.00
25-lb. coating I.C. 16.00
30-lb. coating I.C. 17.25
40-lb. coating I.C. 19.50

Black Plate, 29 gage and lighter

Pittsburgh, Chicago and Gary 3.05c.
Granite City 3.15c.
On cars dock Pacific ports, boxed 4.00c.

HOT ROLLED STRIP

(Widths up to 12 in.)

Base per Lb.

Pittsburgh, Chicago, Gary, Cleveland, Middletown, Youngstown or Birmingham 2.15c.
Detroit, delivered 2.25c.

Cooperage Stock

Pittsburgh & Chicago 2.25c

COLD ROLLED STRIP*

Base per Lb.

Pittsburgh, Youngstown or Cleveland 2.95c.
Chicago 3.05c.
Detroit, delivered 3.05c.
Worcester 3.15c.

* Carbon 0.25 and less.

Commodity Cold Rolled Strip

Pittsburgh, Youngstown, or Cleveland 3.10c.
Detroit, delivered 3.20c.
Worcester 3.50c.

COLD ROLLED SPRING STEEL

Pittsburgh

and

Cleveland Worcester

Carbon 0.26-0.50% 2.95c. 3.15c.
Carbon .51 .75 4.30c. 4.50c.
Carbon .76-1.00 6.15c. 6.35c.
Carbon 1.01 to 1.25 8.35c. 8.55c.

WIRE PRODUCTS

Carload lots, f.o.b. Pittsburgh, Chicago, Cleveland and Birmingham)

To Manufacturing Trade

	Per Lb.
Bright wire	2.60c.
Galvanized wire, base	2.55c.*
Spring wire	3.20c.

* On galvanizing wire to manufacturing trade, size and galvanizing extras are charged, the price Nos. 6 to 9 gage, inclusive, thus being 3.15c.

To the Trade

	Base per Keg
Standard wire nails	\$2.15
Coated nails	2.45
Cut nails, carloads	3.60

Base per 100 Lb.

Annealed fence wire	\$2.95
Galvanized fence wire	3.35
Polished staples	3.15
Galvanized staples	3.40
Twisted barbed wire	3.30
Woven wire fence, base column	67
Single loop bale ties, base col.	56
Stand. 2 pt., 12.5 gage barbed cattle wire, per 80 rod spool	\$2.62
Stand. 2 pt., 12.5 gage barbed hog wire, per 80 rod spool	\$2.80

Note: Birmingham base same on above items, except spring wire.

Add \$4 a ton for Mobile, Ala.; \$5 for New Orleans; \$6 for Lake Charles to above bases, except on galvanized and annealed merchant fence wire, which are \$1 a ton additional in each case.

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh

District and Lorain, Ohio, Mills

F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld

In.	Steel Black Galv.	In.	Wrought Iron Black Galv.
1/4	55	1/4	55
1/2	55	1/2	55
3/4	55	3/4	55
1	55	1	55
1 1/4	55	1 1/4	55
1 1/2	55	1 1/2	55
1 3/4	55	1 3/4	55
2	55	2	55

Lap Weld

1/4	55	1/4	55
1/2	55	1/2	55
3/4	55	3/4	55
1	55	1	55
1 1/4	55	1 1/4	55
1 1/2	55	1 1/2	55
1 3/4	55	1 3/4	55
2	55	2	55

Butt weld, extra strong, plain ends

1/4	55	1/4	55
1/2	55	1/2	55
3/4	55	3/4	55
1	55	1	55
1 1/4	55	1 1/4	55
1 1/2	55	1 1/2	55
1 3/4	55	1 3/4	55
2	55	2	55

Lap weld, extra strong, plain ends

1/4	55	1/4	55
1/2	55	1/2	55
3/4	55	3/4	55
1	55	1	55
1 1/4	55	1 1/4	55
1 1/2	55	1 1/2	55
1 3/4	55	1 3/4	55
2	55	2	55

On butt weld and lap weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base cost.

F.o.b. Gary prices are two points lower discount or \$4 a ton higher than Pittsburgh or Lorain on lap weld and one point lower discount, or \$2 a ton higher, on all butt weld 8 in. and smaller.

Boiler Tubes

Seamless Steel and Lap Weld Commercial Boiler Tubes and Locomotive Tubes. Minimum Wall. (Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

	Seamless Cold Drawn	Seamless Hot Rolled	Lap Weld Hot Rolled
1 in. o.d.	13 B.W.G.	\$ 9.01	\$ 7.82
1 1/4 in. o.d.	13 B.W.G.	10.07	9.26
1 1/2 in. o.d.	13 B.W.G.	11.79	10.33
1 3/4 in. o.d.	13 B.W.G.	13.42	11.64
2 in. o.d.	13 B.W.G.	15.03	13.04
2 1/4 in. o.d.	13 B.W.G.	16.76	14.54
2 1/2 in. o.d.	12 B.W.G.	18.45	16.01
2 3/4 in. o.d.	12 B.W.G.	20.21	17.54
3 in. o.d.	12 B.W.G.	21.42	18.59
3 1/4 in. o.d.	11 B.W.G.	23.37	20.42
3 1/2 in. o.d.	10 B.W.G.	35.20	30.54
4 in. o.d.	10 B.W.G.	43.04	37.35
5 in. o.d.	9 B.W.G.	54.01	46.87
6 in. o.d.	7 B.W.G.	82.93	71.96

Extras for less carload quantities:

40,000 lb. or ft. over	Base
30,000 lb. or ft. to 39,999 lb. or ft.	5%
20,000 lb. or ft. to 29,999 lb. or ft.	10%

10,000 lb. or ft. to 19,999 lb. or ft.	30%
5,000 lb. or ft. to 9,999 lb. or ft.	35%
2,000 lb. or ft. to 4,999 lb. or ft.	45%
Under 2,000 lb. or ft.	65%

CAST IRON WATER PIPE

	Per Net Ton
*6-in. and larger, del'd Chicago	\$51.00
*6-in. and larger, del'd New York	49.00
*6-in. and larger, Birmingham	43.00
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles	52.00
F.o.b. dock, Seattle	52.00
4-in. f.o.b. dock, San Francisco or Los Angeles	55.00
F.o.b. dock, Seattle	52.00

Class "A" and gas pipe, \$3 extra 4-in. pipe is \$3 a ton above 6-in.

Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is \$42, Birmingham, and \$50 delivered Chicago and 4-in. pipe, \$45, Birmingham, and \$54 delivered Chicago.

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List

Machine and carriage bolts:	
1/2 in. & 6 in. and smaller	65, 5 and 5*
Larger and longer up to	
1 in.	60, 10 and 5*
1 1/2 in. and larger	60, 5 and 5*
Lag bolts	60, 10 and 5
Plow bolts, Nos. 1, 2, 3	
and 7	65, 5 and 5
Hot pressed nuts, and c.p.c. and t nuts, square or hex. blank or tapped:	
1/2 in. and smaller	65 and 5
9/16 in. to 1 in. inclusive	60, 5 and 5
1 1/2 in. and larger	60 and 5

* Less carload lots and less than full container quantity. Less carload lots in full container quantity, an additional 10 per cent discount; carload lots and full container quantity, still another 5 per cent discount.

Semi-fin. hexagon nuts U.S.S. S.A.E.	
1/2 in. and smaller	65-5 70
9/16 to 1 in.	60-10 65
1 1/2 in. and larger	60-5 60-5

In full container lots, 10 per cent additional discount.

Stove bolts in packages, nuts attached 75

Stove bolts in packages, with nuts separate 75 and 12 1/2

Stove bolts in bulk 85

On stove bolts freight is allowed to destination on 200 lb. and over.

Large Rivets

(1/2-in. and larger)

Base per 100 Lb.

F.o.b. Pittsburgh, Cleveland

Chicago, Birmingham \$3.40

Small Rivets

(7/16-in. and smaller)

Per Cent Off List

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham 65 and 10

Cap and Set Screws

Per Cent Off List

Milled hexagon head, cap screws,	
1 in. dia. and smaller	50 and 10
Milled square head set screws,	
case hardened, 1 in. dia. and smaller	73 and 10
Milled headless set screws, cut thread 1/4 in. and smaller	68 and 10
Upset hex. head cap screws U.S.S. or S.A.E. thread 1 in. and smaller	65 and 10
Upset set screws, cup and oval points	73 and 10
Milled studs	57 and 10

Alloy and Stainless Steel

Alloy Steel Blooms, Billets and Slabs
F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.
Base price, \$56.00 a gross ton.

Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.	
Open-hearth grade, base	2.80c.
Delivered, Detroit	2.90c.
S.A.E.	
Series	Alloy
Numbers	Differential
200 (1/2% Nickel)	per 100 Lb. \$0.35

2100 (1 1/4% Nickel)	\$0.75
2300 (3 1/2% Nickel)	1.55
2500 (5% Nickel)	2.25
3100 Nickel-chromium	0.70
3200 Nickel-chromium	1.85
3300 Nickel-chromium	3.80
3400 Nickel-chromium	3.20
4100 Chromium-molybdenum (0.15 to 0.25 Molybdenum)	0.55
4100 Chromium-molybdenum (0.25 to 0.40 Molybdenum)	0.75
4600 Nickel - molybdenum (0.20 to 0.30 Mo. 1.50 to 2.00 Ni.)	1.10
5100 Chrome steel (0.60-0.90 Cr.)	0.35
5100 Chrome steel (0.80-1.10 Cr.)	0.45
5100 Chromium spring steel	0.15
6100 Chromium-vanadium bar	1.20
6100 Chromium-vanadium spring steel	0.85
Chromium-nickel vanadium	1.50
Carbon-vanadium	0.85

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. Slabs with a section area of 16 in. and 2 1/2 in. thick or over take the billet base.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 3.40c. base per lb. Delivered Detroit, 3.50c., carlots

CORROSION & HEAT RESISTANT ALLOYS

(Base prices, cents per lb., f.o.b. Pittsburgh)

Chrome-Nickel

	No. 304	No. 302
Forging billets	21.25c.	20.40c.
Bars	25c.	24c.
Plates	29c.	27c.
Structural shapes	25c.	24c.
Sheets	36c.	34c.
Hot-rolled strip	23.50c.	21.50c.
Cold-rolled strip	30c.	28c.
Drawn wire	25c.	24c.

Straight Chrome

	No. 410	No. 430	No. 442	No. 446
Bars	18.50c.	19c.	22.50c.	27.50c.
Plates	21.50c.	22c.	25.50c.	30.50c.
Sheets	26.50c.	29c.	32.50c.	36.50c.
Hot Strip	17c.	17.50c.	23c.	28c.
Cold stp.	22c.	22.50c.	28.50c.	36.50c.

TOOL STEEL

High speed	67c.
High-carbon-chrome	43c.
Oil-hardening	24c.
Special	22c.
Extra	18c.
Regular	14c.

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 3c. a lb. higher

British and Continental

BRITISH

Per Gross Ton f.o.b. United Kingdom Ports

Ferromanganese, export	Nominal
Tin plate, per base box	20s. 3d.
Steel bars, open hearth	£10 8s.
Beams, open-hearth	£10
Channels, open-hearth	£10 5s.
Angles, open-hearth	£10
Black sheets, No. 24 gage	£13
Galvanized sheets, No. 24 gage	£15 15s.

CONTINENTAL

Per Gross Ton, Gold f. f.o.b. Continental Ports

Billets, Thomas	Nominal
Wire rods, No. 5 B.W.G.	£5 10s.
Steel bars, merchant	£5 5s.
Sheet bars	Nominal
Plate 1/4 in. and up	£5 7s.
Plate 3/16 in. and 5 mm.	£5 13s.
Sheet 1/4 in.	£5 9s. 6d.
Beams, Thomas	£4 18s.
Angles (Basic)	£4 18s.
Hoops and strip, base	£5 12s.

RAW MATERIALS PRICES

PIG IRON

No. 2 Foundry

F.o.b. Everett, Mass.	\$22.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa., and Sparrows Point, Md.	22.00
Delivered Brooklyn	24.50
Delivered Newark or Jersey City	23.53
Delivered Philadelphia	22.84
F.o.b. Neville Island, Erie, Pa., Toledo, Chicago, Granite City, Cleveland and Youngstown ..	21.00
F.o.b. Buffalo	21.00
F.o.b. Detroit	21.00
Southern, delivered Cincinnati ..	21.06
Northern, delivered, Cincinnati ..	21.44
F.o.b. Duluth	21.50
F.o.b. Provo, Utah	19.00
Delivered, San Francisco, Los Angeles or Seattle	24.50
F.o.b. Birmingham*	17.38

* Delivered prices on southern iron for shipment to northern points are 38c. a ton below delivered prices from nearest northern basing point on iron with phosphorus content of 0.70 per cent and over.

Malleable

Base prices on malleable iron are 50c. a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same, except at Birmingham and Provo, which are not malleable iron basing points.

Basic

F.o.b. Everett, Mass.	\$22.25
F.o.b. Bethlehem, Birdsboro, Swedeland and Steelton, Pa., and Sparrows Point, Md.	21.50
F.o.b. Buffalo	20.00
F.o.b. Neville Island, Erie, Pa., Toledo, Chicago, Granite City, Cleveland and Youngstown ..	20.50
Delivered Philadelphia	22.34
Delivered Canton, Ohio	21.89
Delivered Mansfield, Ohio	22.44
F.o.b. Birmingham	16.00

Bessemer

F.o.b. Buffalo	\$22.00
F.o.b. Everett, Mass.	23.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa.	23.00
Delivered Newark or Jersey City	24.53
Erie, Pa., and Duluth	22.00
F.o.b. Neville Island, Toledo, Chicago and Youngstown ..	21.50
F.o.b. Birmingham	22.00
Delivered Cincinnati	22.11
Delivered Canton, Ohio	22.89
Delivered Mansfield, Ohio	23.44

Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.	26.50
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Gray Forge

Valley or Pittsburgh furnace...	\$20.50
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Charcoal

Lake Superior furnace	\$25.00
Delivered Chicago	28.34

Canadian Pig Iron

Per Gross Ton

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	\$26.50
No. 2 fdy., sil. 1.75 to 2.25	25.50
Malleable	26.00
Basic	25.50

Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75	\$27.50
No. 2 fdy., sil. 1.75 to 2.25	27.00
Malleable	27.50
Basic	27.00

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

Per Gross Ton

Domestic, 80% (carload)\$80.00

Spiegeleisen

Per Gross Ton Furnace

Domestic, 19 to 21%\$28.00

Domestic, 26 to 28% 33.00

Electric Ferrosilicon

Per Gross Ton Delivered; Lump Size

50% (carload lots, bulk)\$69.50*

50% (ton lots in 50 gal. bbl.).. 80.50*

75% (carload lots, bulk).....126.00*

75% (ton lots in 50 gal. bbl.)..139.00*

Bessemer Ferrosilicon

F.o.b. Furnace, Jackson, Ohio

Per Gross Ton

10.00 to 10.50%\$30.50

For each additional 0.50% silicon up to 12%, 50c. per ton is added. Above 12% add 75c. per ton.

For each unit of manganese over 2%, \$1 per ton additional. Phosphorus 0.75% or over, \$1 per ton additional.

Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Silvery Iron

Per Gross Ton

F.o.b. Jackson, Ohio, 500 to

5.50%\$24.50

For each additional 0.5% silicon up to 12%, 50c. a ton is added. Above 12% add 75c. a ton.

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Manganese, each unit over 2%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional.

Ferrochrome

Per Lb. Contained Cr., Delivered Carlots, Lump Size, on Contract

4 to 6% carbon10.50c.*

2% carbon16.50c.*

1% carbon17.50c.*

0.10% carbon19.50c.*

0.06 carbon20.00c.*

Silico-manganese

Per Gross Ton, Delivered, Lump Size, Bulk, on Contract

3% carbon\$83.00

2.50% carbon 88.00

2% carbon 93.00

1% carbon103.00

Other Ferroalloys

Ferrotungsten, per lb. contained W del., carloads..... \$1.75

Ferrotungsten, 100 lbs. and less

Ferrovandium, contract, per lb. contained V., delivered

.....\$2.70 to \$2.90†

Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y., tons lots ..

.....\$2.25†

Ferrocobaltititanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract

per net ton\$142.50

Ferrocobaltititanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract,

per net ton\$157.50

Ferrophosphorus, electric, or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with \$3 unit-

age, freight equalized with Rockdale, Tenn., per gross

ton\$58.50

Ferrophosphorus, electrolytic, 23-26% in car lots, f.o.b. Monsanto (Siglo), Tenn.,

24%, per gross ton, \$3 unit-

age, freight equalized with Nashville

.....\$75.00

Ferromolybdenum, per lb. Mo. f.o.b. furnace

.....95c.

Calcium molybdate, per lb. Mo. f.o.b. furnace

.....80c.

* Spot prices are \$5 per ton higher.

† Spot prices are 10c. per lb. of contained element higher.

ORES

Lake Superior Ores

Delivered Lower Lake Ports

Per Gross Ton

Old range, Bessemer, 51.50%...\$5.25

Old range, non-Bessemer, 51.50% 5.10

Messabi, Bessemer, 51.50%..... 5.10

Messabi, non-Bessemer, 51.50%.. 4.95

High phosphorus, 51.50%..... 4.85

Foreign Ore

C.i.f. Philadelphia or Baltimore

Per Unit

Iron, low phos., copper free, 55 to 58% dry, Algeria

..... 12c.

Iron, low phos., Swedish, average, 68½% iron

..... 12c.

Iron, basic or foundry, Swedish, aver. 65% iron

..... 11c.

Iron, basic or foundry, Russian, aver. 65% iron

.....Nominal

Man., Caucasian, washed 52%

..... 30c.

Man., African, Indian, 44-48%

..... 25c.

Man., African, Indian, 49-51%

..... 29c.

Man., Brazilian, 46 to 48½%

..... 27c.

Per Short Ton Unit

Tungsten, Chinese, Wolframite, duty paid, delivered

.....\$19.00

Tungsten, domestic, scheelite delivered

.....\$17.00 to \$18.00

Chrome ore (lump) c.i.f. Atlantic Seaboard, per gross

ton: South African (low grade)

.....\$15.00

Rhodesian, 45%

..... 19.00

Rhodesian, 48%

..... 23.00

Turkish, 48-49%

..... 23.00

Turkish, 45-46%

..... 19.00

Turkish, 40-44%

..... 17.00

Chrome concentrates (Turkish) c.i.f. Atlantic Seaboard, per gross ton:

50%

.....\$25.00

48-49%

..... 23.50

FLUORSPAR

Per Net Ton

Domestic washed gravel, 85-5, f.o.b. Kentucky and Illinois

mines, all rail\$17.00 to \$18.00

Domestic, f.o.b. Ohio River landing barges

..... 18.00

No. 2 lump, 85-5, f.o.b. Kentucky and Ill. mines

..... 18.00

Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid....

..... 24.30

Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not

over 2½% silicon, f.o.b. Illinois and Kentucky mines....

..... 31.50

FUEL OIL

Per Gal.

No. 2, f.o.b. Bayonne

..... 4.00c.

No. 6, f.o.b. Bayonne

..... 2.26c.

No. 5 Bur. Stds., del'd Chicago. 3.25c.

No. 6 Bur. Stds., del'd Chicago. 2.75c.

No. 3 distillate, del'd Cleve'd.. 5.50c.

No. 4 industrial, del'd Cleve'd. 5.25c.

No. 5 industrial, del'd Cleve'd. 3.00c.

No. 6 industrial, del'd Cleve'd. 2.75c.

COKE

Per Net Ton

Furnace, f.o.b. Connells-

ville, Prompt

.....\$3.75

Furnace, f.o.b. Connells-

ville, Prompt

.....\$4.75 to 5.50

Foundry, by-product, Chicago ovens

..... 10.25

Foundry, by-product, del'd New England....

..... 12.50

Foundry, by-product, del'd Newark or Jersey

City

.....10.88 to 11.40

Foundry, by-product, Philadelphia

..... 10.95

Foundry, by-product, delivered Cleveland ...

..... 10.30

Foundry, by-product, delivered Cincinnati...

..... 9.75

Foundry, Birmingham...

..... 7.50

Foundry, by-product, del'd St. Louis industrial district

.....10.75 to 11.00

Foundry, from Birmingham, f.o.b. cars dock

Pacific ports

..... 14.75

IRON AND STEEL WAREHOUSE PRICES

PITTSBURGH*

Base per Lb.

Plates	3.55c.
Shapes	3.55c.
Soft steel bars and small shapes	3.60c.
*Reinforcing steel bars	2.70c.
Cold finished bars and screw stock	3.95c.
Hot rolled strip	3.75c.
Hot rolled sheets	3.50c.
Galv. sheets (24 ga.) 500 lb. to 1499 lb.	4.50c.
Wire, black, soft annealed	3.15c.
Wire, galv., soft	3.55c.
Track spikes 1/2 in. and smaller (1 to 24 kegs)	3.40c.
Wire nails (in 100-lb. kegs)	2.65c.

On plates, structurals, bars, strip and hot rolled sheets, base applied to orders of 400 to 1999 lb.
* On reinforcing bars base applies to orders of less than one ton and includes switching and carting charge.

* All above prices for delivery within the Pittsburgh switching district.

NEW YORK

Base per Lb.

Plates, 1/4 in. and heavier	3.76c.
Structural shapes	3.75c.
Soft steel bars, round	3.94c.
Iron bars, Swed. charcoal	7.50 to 8.25c.
Cold-fin, shafting and screw stock	
Rounds, squares, hexagons	4.39c.
Flats up to 12 in. wide	4.39c.
Cold-rolled strip, soft and quarter hard	3.66c.
Hot-rolled strip, soft O.H.	4.11c.
Hot-rolled sheets (10 ga.)	3.73c.
Galv. sheets (24 ga.)	4.50c.
Long ternes (24 ga.)	5.50 to 6.20c.
Cold-rolled sheets (20 ga.)	
Standard quality	4.90c.
Deep drawing	5.15c.
Stretcher leveled	5.50c.
SAE, 2300, hot-rolled	7.50c.
SAE, 3100, hot-rolled	6.10c.
SAE, 6100, hot-rolled annealed	10.25c.
SAE, 2300, cold-rolled	8.69c.
SAE, 3100, cold-rolled, annealed	7.29c.
Floor plate, 1/4 in. and heavier	5.43c.
Standard tool steel	12.50c.
Wire, black, annealed (No. 9)	4.65c.
Wire, galv. (No. 9)	5.00c.
Open-hearth spring steel	4.75c. to 10.25c.
Common wire nails, per keg in 25 keg lots	\$2.90

CHICAGO

Base per Lb.

Plates and structural shapes	3.55c.
Soft steel bars, rounds and angles	3.60c.
Soft steel squares, hexagons, channels and Tees	3.75c.
Hot rolled strip	3.75c.
Floor plates	5.15c.
Hot rolled sheets	3.50c.
Galvanized sheets	4.50c.
Cold rolled sheets	4.45c.
Cold finished carbon bars	4.05c.

Above prices are subject to deductions and extras for quantity and are f.o.b. consumer's plant within Chicago free delivery zone.

CLEVELAND

Base per Lb.

Plates	3.55c.
Structural shapes	3.73c.
Soft steel bars	3.50c.
Reinfor. bars (under 2000 lb.)†	2.55c.
Cold-fin. bars (1000 lb., over)	4.05c.
Hot-rolled strip	3.65c.
Cold rolled sheets	4.70c.
Cold-finished strip	3.35c.
Galvanized sheets (No. 24)	4.62c.
Hot-rolled sheets	3.50c.
Floor plates, 3/16 in. and heavier	5.33c.
*Black ann'd wire, per 100 lb.	\$3.10
*No. 9 galv. wire, per 100 lb.	3.50
*Com. wire nails, base per keg	2.60
Hot rolled alloy steel (3100)	6.05c.
Cold rolled alloy steel (3115)	6.85c.

* For 5000 lb. or less.
† 500 lb. base quantity.

Prices shown on hot rolled bars, strip, sheets, shapes and plates are for 400 to 1999 lb. Alloy steel, 1000 lb. and over; galvanized sheets, 150 to 1499 lb.; cold rolled sheets, 399 lb. and under.

ST. LOUIS

Base per Lb.

Plates and structural shapes	3.32c.
Bars, soft steel (rounds and flats)	3.37c.
Bars, soft steel (squares, hexagons, ovals, half ovals and half rounds)	4.02c.
Cold fin. rounds, shafting, screw stock	4.32c.
Galv. sheets (24 ga.)	4.77c.
Hot rolled sheets	3.77c.
Galv. corrugated sheets, 24 ga. and heavier*	4.82c.
Structural rivets	5.02c.

* No. 26 and lighter take special prices.

BOSTON

Base per Lb.

Structural shapes, 3 in. and larger	5.85c.
Plates, 1/4 in. and heavier	3.85c.
Bars	3.98c.
Heavy hot rolled sheets	3.86c.
Hot rolled sheets	4.21c.
Hot rolled annealed sheets	4.76c.
Galvanized sheets	4.76c.
Cold rolled sheets	4.93c.

The following quantity differentials apply: Less than 100 lb., plus \$1.50 per 100 lb.; 100 to 399 lb. plus 50c.; 400 to 1999 lb. base; 2000 to 9999 lb. minus 20c.; 10,000 to 39,999 lb. minus 30c.; 40,000 lb. and over minus 40c.

BUFFALO

Plates	3.77c.
Floor plates	5.40c.
Struc. shapes	3.55c.
Soft steel bars	3.60c.
Reinforcing bars (20,000 lb. or more)	2.05c.
Cold-fin. flats, squares, rounds, and hex.	4.05c.
Hot-rolled sheets, 3/16 x 14 in. to 48 in. wide incl. also sizes No. 8 to 30 ga.	3.50c.
Galv. sheets (24 ga.)	4.50c.
Bands and hoops	3.97c.

NEW ORLEANS

Base per Lb.

Mild steel bars	4.20c.
Reinforcing bars	3.24c.
Structural shapes	4.10c.
Plates	4.10c.
Hot-rolled sheets, No. 10	4.35c.
Steel bands	4.75c.
Cold-finished steel bars	5.10c.
Structural rivets	4.85c.
Boiler rivets	4.85c.
Common wire nails, base per keg	3.55
Bolts and nuts, per cent off list	60

REFRACATORIES PRICES

Fire Clay Brick

Per 1000 f.o.b. Works

Super-duty brick, at St. Louis	\$60.80
First quality Pennsylvania, Maryland, Kentucky, Missouri and Illinois	47.50
First quality, New Jersey	52.50
Second quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	42.75
Second quality, New Jersey	49.00
No. 1, Ohio	39.90
Ground fire clay, per ton	7.10

Silica Brick

Per 1000 f.o.b. Works

Pennsylvania	\$40.00
Chicago District	49.00
Birmingham	40.00
Silica cement per net ton (Eastern)	8.55

Chrome Brick

Net per Ton

Standard f.o.b. Baltimore, Plymouth Meeting and Chester	\$47.00
Chemically bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	47.00

Magnesite Brick

Net per Ton

Standard f.o.b. Baltimore and Chester	\$67.00
Chemically bonded, f.o.b. Baltimore	57.00

Grain Magnesite

Net per Ton

Imported, f.o.b. Baltimore and Chester, Pa. (in sacks)	\$45.00
Domestic, f.o.b. Baltimore and Chester, in sacks	40.00
Domestic, f.o.b. Chewelah, Wash. (in bulk)	22.00

PHILADELPHIA

Base per Lb.

*Plates, 1/4-in. and heavier	3.40c.
*Structural shapes	3.40c.
*Soft steel bars, small shapes, iron bars (except bands)	3.60c.
†Reinforc. steel bars, square and deformed	2.61c.
Cold-finished steel bars	4.36c.
*Steel hoops	4.10c.
*Steel bands, No. 12 and 3/16 in. incl.	3.60c.
*Spring steel	4.75c.
†Hot-rolled anneal. sheets	3.10c.
†Galvanized sheets (No. 24)	4.33c.
*Diam. pat. floor plates, 1/4 in.	5.00c.

These prices are for delivery in Philadelphia trucking area.

*Base prices subject to deduction on orders aggregating 4000 lb. or over

†For 25 bundles or over.

†For one to five tons.

BIRMINGHAM

Bars and bar shapes	\$3.85 base
Structural shapes and plates	3.75 "
Hot rolled sheets No. 10 ga.	3.80 "
Hot rolled sheets No. 24 ga.	4.40 " 3500 lb. and over
Galvanized sheets No. 24 ga.	5.05 " 3500 lb. or more
Strip	4.05 "
Reinforcing bars	3.85 "
Floor plates	5.96 "
Cold finished bars	4.91 "
Machine and carriage bolts	.50 & 10 off list
Rivets (structural)	\$4.60 base

On plates, shapes, bars, hot-rolled strip heavy hot-rolled sheets, the base applies on 400 to 3999 lb. All prices are f.o.b. consumer's plant.

PACIFIC COAST

Base per Lb.

	San Francisco	Los Angeles	Seattle
Plates, tank and U. M.	4.00c.	4.00c.	4.05c.
Shapes, standard	4.00c.	4.00c.	4.05c.
Soft steel bars	4.05c.	4.00c.	4.30c.
Reinforcing bars, f.o.b. cars dock			
Pacific ports	2.675c.	open.	2.975c.
Hot-rolled sheets (No. 10)	4.00c.	4.20c.	3.95c.
Galv. sheets (No. 24 and lighter)	5.15c.	5.05c.	5.25c.
Galv. sheets (No. 22 and heavier)	5.40c.	5.05c.	5.25c.
Cold-finished steel			
Rounds	6.55c.	6.60c.	7.10c.
Squares and hexagons	7.80c.	7.85c.	7.10c.
Flats	8.30c.	8.35c.	8.10c.
Common wire nails—base per keg less carload	\$3.20	\$3.05	\$3.00

All items subject to differentials for quantity.

ST. PAUL

Base per Lb.

Mild steel bars, rounds	4.10c.
Structural shapes	4.00c.
Plates	4.00c.
Cold-finished bars	4.83c.
Hot-rolled annealed sheets, No. 24	4.75c.
Galvanized sheets, No. 24	5.00c.

On mild steel bars, shapes and plates the base applies on 400 to 14,999 lb. On hot-rolled sheets, galvanized sheets and cold-rolled sheets base applies on 15,000 lb. and over. Base on cold-finished bars is 1000 lb. and over of a size.

DETROIT

Base per Lb.

Soft steel bars	3.43c.
Structural shapes	3.80c.
Plates	3.75c.
Floor plates	5.42c.
Hot-rolled sheets, 8 to 30 gages above 12 in. and 3/16 in., 24 in. to 48 in. wide	3.58c.
Cold-rolled sheets	4.65c.
Galvanized sheets	4.74c.
Hot-rolled strip, under No. 12	3.83c.
Hot-rolled strip, No. 12 and over	3.58c.
Cold-finished bars	3.60c.
Cold-rolled strip	3.55c.
Hot-rolled alloy steel (SAE 3100 Series)	6.17c.

Quantity extras apply to all items.

PLANT EXPANSION AND EQUIPMENT BUYING

◀ NORTH ATLANTIC ▶

Simmons Co., 230 Park Avenue, New York, manufacturer of steel bedsteads, springs and other metal furniture, plans one-story addition to branch plant at Linden, N. J. Cost over \$75,000 with equipment. William L. Finne, 124 West Jersey Street, Elizabeth, N. J., is architect.

Techumy-Moser & Co., Long Island City, organized to manufacture machinery parts, have leased space in building at 44-02 Twenty-third Street for plant.

Commanding Officer, Ordnance Department, Watervliet Arsenal, Watervliet, N. Y., asks bids until March 7 and 9 for gages (Circulars 148 and 149 respectively).

State Department of Mental Hygiene, State Office Building, Albany, N. Y., will take bids soon on general contract for one-story shop at Utica State Hospital, Utica, N. Y., for which revised plans are being completed. Cost close to \$120,000 with equipment. T. F. Farrell, address noted, is engineer.

National Foundry Co. of New York, 10 Sandford Street, Brooklyn, has filed plans for alterations and improvements in one-story building at 490-92 Flushing Avenue, to be used as a machine shop. Jacob Langfur, 36 West Forty-fourth Street, New York, is architect.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until March 7 for 200 cylinder regulators (Schedule 5697), pressure gages (Schedule 5705); until March 10 for 30,000 jack-knives (Schedule 5668); until March 14, centrifugal, turbine and motor-driven pumps, with spare parts, tools and wrenches (Schedule 5706) for Brooklyn Navy Yard; until March 7, copper pipe, and brass and copper tubing (Schedule 5656) for Brooklyn and Philadelphia yards.

Drosin Motors, Inc., 2548 East Tremont Avenue, New York, local representative for Dodge and Plymouth automobiles, has leased a two-story building at 1178 East 180th Street, about 22,000 sq. ft. of floor space, for service, parts and repair division.

Department of Public Works, City Hall, Albany, N. Y., plans new steel hangar, with shop and reconditioning facilities at municipal airport. Cost about \$100,000 including extension of runways.

Signal Corps Procurement District, Army Base, Fifty-eighth Street and First Avenue, Brooklyn, asks bids until March 17 for mast base, mast section, antenna, adapters, binding posts, etc. (Circular 180).

Wallace & Tiernan Co., Inc., 11 Mill Street, Belleville, N. J., manufacturer of chlorine control equipment, chemical feed apparatus, etc., has purchased for expansion four-story building near plant, totaling over 35,000 sq. ft. of floor space.

Signal Corps Procurement District, Fort Monmouth, N. J., asks bids until March 6 for 3000 to 12,000 ft. of underground (submarine) cable (Circular 12).

Commanding Officer, Ordnance Department, Picatinny Arsenal, near Dover, N. J., asks bids until March 6 for reworking 7100 lb. of brass turnings (Circular 586).

Borough Board of Education, Sayreville, N. J., asks bids until March 8 for manual training shop machines and equipment, shop furniture and miscellaneous equipment for Wilson School. Alexander Merchant & Son, 1 Elm Row, New Brunswick, N. J., are architects.

Commanding Officer, Ordnance Department, Frankford Arsenal, Philadelphia, asks bids until March 7 for one geared-head turret lathe (Circular 780).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until March 7 for 100 sets of torque wrenches (Schedule 5680) for Philadelphia Navy Yard.

◀ BUFFALO DISTRICT ▶

Eastman Kodak Co., Kodak Park, Rochester, N. Y., has let general contract to H. A. McMurphy, 6347 Eleanor Avenue, Los Angeles, for new two-story and basement processing plant, 55 x 132 ft., at 1013 North Las Palmas Avenue, Los Angeles. Cost about \$150,000 with equipment. W. E. Wilson, 5655 Wilshire Boulevard, Los Angeles, is engineer.

Board of Niagara County Supervisors, Court House, Lockport, N. Y., plans one-story machine shop, and equipment storage and distributing building adjoining garage station of County Highway Department, South Niagara Street. Cost close to \$50,000 with equipment.

Guaranteed Parts Co., Inc., Union Springs, N. Y., manufacturer of automobile parts, has purchased former factory of Fairhouse, Inc., near Seneca Falls, N. Y., and will remodel for branch plant. Main offices are at 250 West Fifty-fourth Street, New York.

◀ NEW ENGLAND ▶

Hartford-Empire Co., Homestead Avenue, Hartford, Conn., bottle-making and other glass plant equipment, has asked bids on general contract for two-story and basement addition, 33 x 86 ft., for expansion in experimental division. Cost over \$50,000 with equipment. Mylchreest & Reynolds, 238 Palm Street, are consulting engineers.

Commanding Officer, Ordnance Department, Springfield Armory, Springfield, Mass., asks bids until March 6 for two thread milling machines and extra equipment (Circular 295), three motor-driven automatic milling machines (Circular 307); until March 7, one automatic milling machine (Circular 304), one drilling and reaming machine (Circular 305); until March 8, two automatic milling machines, with duplex spindles, fixture or fixtures (Circular 299); until March 9, one motor-driven small automatic milling machine (Circular 305); until March 16 for machinery with special equipment (Circular 308).

United Aircraft Corp., East Hartford, Conn., plans expansion in production facilities for airplane engines and parts, and propellers. Arrangements are being made for early removal of Chance Vought Aircraft Division from East Hartford to plant of Sikorsky Aviation Division of company, Stratford, Conn. Vacated space at East Hartford will be used by Hamilton Standard Propellers Division for expansion, removing from present factory adjoining Pratt & Whitney Aircraft Division, to that location, and Pratt & Whitney Division will expand facilities in vacated Hamilton plant.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until March 10 for 25 two-wheel trucks, assembled complete, for Newport, R. I., Naval Station (Schedule 5673).

◀ WASHINGTON DIST. ▶

Board of District Commissioners, District Building, Washington, asks bids until March 7 for 100 fire hydrants for water bureau; until March 10, shop and mechanical drawing furniture for public schools.

General Purchasing Officer, Panama Canal, Washington, asks bids until March 10 for wire rope, steel wire, brass pipe, common steel wire nails, chain hoists, copper cable, three-conductor rubber insulated cable, copper cord, pneumatic hose and other equipment (Schedule 3428).

Glenn L. Martin Co., Middle River, Baltimore, airplanes and parts, has let general contract to Turner Construction Co., Architects'

Building, Philadelphia, for two-story addition, 340 x 694 ft., about 440,000 sq. ft. of floor space, for assembling division for medium-sized airplanes. Cost close to \$3,000,000, of which over \$1,200,000 will be expended for tools and equipment. Company also has work under way on 500-acre flying field for testing aircraft.

Chemical Warfare Service, Edgewood Arsenal, Edgewood, Md., asks bids until March 13 for 25,000 aluminum elbow nozzles and 18,000 aluminum angle tubes (Circular 258).

Chesapeake-Camp Corp., Franklin, Va., manufacturer of kraft paper stocks, plans two one-story additions, for expansion in recovery division and for pulp department respectively. Cost about \$225,000 and \$30,000 with equipment, in order noted.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until March 7 for acetylene cylinder valves, ammonia cylinder valves, carbon dioxide, oxygen or air cylinder valves (Schedule 5694); until March 10, one motor-driven, milling, drilling and boring machine (Schedule 5653) for Norfolk Navy Yard; motor-driven hob sharpening machine (Schedule 5646) for Newport, R. I., Naval Station; two nickel-copper alloy cylinder forgings (Schedule 5652) for Washington yard; until March 14, one motor-driven bench milling machine (Schedule 5648), 8000 ft. of galvanized rigid conduit pipe (Schedule 5645), one combined hand and electric steering engine (Schedule 5687); until March 17, motor-driven bench-type sensitive drills, equipment and spare parts (Schedule 5665), steel wire nails (Schedule 5672) for Eastern and Western yards.

◀ SOUTH ATLANTIC ▶

Chief, Property and Contract Division, Supply Service, Veterans' Administration, Washington, asks bids until March 28 for steam power plant and other utilities at institution at Fayetteville, N. C., including boiler house, building No. 11, with complete boiler plant equipment, radial brick stack, etc.; one 100,000-gal. elevated steel tank and tower; refrigerating machinery and other equipment.

Goodyear Tire & Rubber Co., Akron, Ohio, has let general contract to H. K. Ferguson Co., Cleveland, for one-story addition to mill at Cedartown, Ga., operated in name of Goodyear Clearwater Mills. Cost over \$75,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until March 10 for three motor-driven engine lathes (Schedule 5651) for Charleston, S. C., yard.

◀ WESTERN PA. DIST. ▶

Hammermill Paper Co., Erie, Pa., bond and other writing paper stocks, is considering one-story mill addition. Cost over \$50,000 with equipment.

City Council, City Hall, Franklin, Pa., asks bids until March 6 for equipment in connection with new sewerage treatment plant, including two motor-driven centrifugal pumping units and accessories, each with capacity of 1200 gal. per min. (Contract No. 3); electrical equipment, including switchgear, control apparatus, panelboards, etc. (Contract No. 6).

Shawmut Coal Mining Co., Brandy Camp (Elk County), Pa., plans rebuilding of tippie at coal-mining properties, with installation of new crushing, conveying, loading and other machinery. Cost over \$60,000.

◀ SOUTH CENTRAL ▶

Precision Truing & Machine Tool Co., 515 Scott Street, Covington, Ky., manufacturer of tools and mechanical equipment, will take bids soon on general contract for one-story machine shop on Sixteenth Street, near Madison Street. Cost close to \$40,000 with equipment.

Louisville Gas & Electric Co., 311 West Chestnut Street, Louisville, has arranged fund of \$1,565,781 for expansion and improvements during 1939, including power plants and installation of equipment, transmission and dis-

tributing lines, power substations and other structures.

City Council, Ruston, La., plans extensions and improvements in municipal electric light and water plant, including new 1000-hp. engine unit and other equipment. Cost about \$125,000. Financing is being arranged through Federal aid.

Liberty Cherry & Fruit Co., Inc., Second and Madison Streets, Covington, Ky., processed fruits, will take bids soon for one-story addition, about 52,000 sq. ft. of floor space, and improvements in present plant. Cost over \$85,000 with equipment. Carl J. Kiefer Associates, Inc., Schmidt Building, Cincinnati, is consulting engineer.

◀ OHIO AND INDIANA ▶

Cleveland Pneumatic Tool Co., 3734 East Seventy-eighth Street, Cleveland, has let general contract to Sam W. Emerson Co., 1836 Euclid Avenue, for one and two-story addition, 130 x 135 ft. Cost over \$70,000 with equipment. Ernest McGeorge, East Ninety-third Street and Quincy Avenue, is consulting engineer.

City Council, North Baltimore, Ohio, plans new municipal electric power plant. Cost about \$221,000 with equipment. Appropriation in that amount has been authorized at special election, including Federal grant of \$87,000.

Aeronautical Corp. of America, Inc., Lunken Airport, Turkey Bottom Road, Cincinnati, airplanes and parts, has let general contract to Jerome M. Jackson Realty Co., 4023 Eastern Avenue, for one-story addition. Cost close to \$40,000 with equipment. Carlton, Frankenberg & Batson, 4122 Davis Lane, are architects.

Contracting Officer, Materiel Division, Air Corps, Wright Field, Dayton, Ohio, asks bids until March 6 for hand taps (Circular 716), two air chute assemblies (Circular 724), union cones, couplings, connectors, bronze elbows, nipples, hose liners, bronze tees, bushings and other equipment (Circular 704), light service clamps (Circular 756); until March 9, altitude correction computer assemblies (Circular 745), three torsiongraphs (Circular 746); until March 10, two blower assemblies (Circular 758); until March 13, fender assemblies and magazine assemblies (Circular 742).

Barberton Foundry Co., Barberton, Ohio, iron castings, plans one-story addition and improvements in present plant. Cost close to \$40,000 with equipment.

Board of School Trustees, Administration Building, South Bend, Ind., plans manual training department in new two-story and basement U-shaped East Side High School, Twykenham Drive and Mishawaka Street, for which bids have been asked on general contract. Cost about \$665,000. Maurer & Maurer, 107 Lincolnway East, South Bend, are architects; Bevington-Williams, Inc., Indiana Pythian Building, Indianapolis, is mechanical engineer.

Indiana General Service Co., 202 South Washington Street, Marion, Ind., is arranging fund of about \$900,000 for extensions in plants and system, including transmission and distributing lines in several counties.

◀ MICHIGAN DISTRICT ▶

Martin Electric Co., 705 Piquette Street, Detroit, manufacturer of electric welding equipment and supplies, plans new one-story plant on East Outer Drive, with office building adjoining. Cost over \$45,000 with equipment. O'Dell & Rowland Associates, Inc., Marquette Building, is architect.

Fruehauf Trailer Co., 10940 Harper Avenue, Detroit, is considering new one-story branch plant at Los Angeles, supplementing present plant at 2160 East Twenty-fifth Street, Vernon district. New unit will approximate 100,000 sq. ft. of floor space. Cost close to \$200,000 with equipment.

Air Base Quartermaster, Selfridge Field, Mich., asks bids until April 3 for new steel frame control tower (Circular 828-14).

◀ SOUTHWEST ▶

Mines Equipment Co., 1909 South Kingshighway, St. Louis, manufacturer of mining equipment and supplies, has asked bids on general contract for one-story addition, 95 x 105 ft., and improvements in present plant. Cost over \$50,000 with equipment. Norman I. Bailey, 26 Fern Ridge Street, Valley Park, St. Louis, is architect.

Board of Education, Herington, Kan., will begin work soon on two-story and basement industrial arts building at high school, 62 x 100 ft. Cost over \$60,000 with equipment. Murray & Cayton, Citizens' Bank Building, Abilene, Kan., are architects.

Farley Co-operative Elevator Association, Farley, Mo., plans new grain elevator, with capacity of about 90,000 bu. Cost over \$45,000 with elevating, conveying, screening and other equipment.

Oklahoma Gas & Electric Co., Oklahoma City, Okla., has arranged fund of \$1,851,000 for expansion and improvements in power plants and system this year, including equipment for modernization and expansion, transmission and distributing lines, power substations, switching station, and other operating facilities.

Southline Metal Products Co., Houston, Tex., has leased one-story building, 75 x 125 ft., to be erected on Sabine Street, by Hermann Hospital Estate, Stewart Building, P. F. Eller, First National Bank Building, contractor. Plant will manufacture steel cabinets, steel filing cases and kindred specialties. Cost over \$65,000 with equipment.

United States Engineer Office, Federal Building, Galveston, Tex., asks bids until March 6 for eight right-hand cast steel hopper gates and eight left-hand similar gates, also for 16 cast steel hopper gate hinge pads, right-hand, and 16 left-hand (Circular 194); 16 cast steel hopper gate rod couplings and one pattern for hopper gate rod coupling (Circular 195), six cast iron strut bushings and six cast iron skin bushings (Circular 196).

Acme Screen Co., Inc., 915 South Peak Street, Dallas, Tex., wire screens, etc., plans rebuilding part of plant recently damaged by fire. Loss close to \$45,000 with equipment.

◀ MIDDLE WEST ▶

General Steel Warehouse Co., Inc., 2445 North Keeler Street, Chicago, iron and steel products, has leased one-story building at Kostner Avenue and Cortland Street, about 50,000 sq. ft. of floor space, for new storage and distributing plant.

Milwaukee Road, Union Station, Chicago, plans new fruit loading and handling building at St. Paul, Minn., with mechanical-handling facilities for 20-car capacity; also extensions and improvements in foundry used for car wheels at Milwaukee, including equipment. Cost over \$100,000.

Ruda Co., 2306 South Kedzie Avenue, Chicago, manufacturer of metal door and window frames, etc., has engaged James B. and Adrian Rezny, 2202 South Pulaski Road, architects, to prepare plans for one-story addition, 65 x 125 ft., to two-story and basement building at 2117-27 South Troy Street, recently acquired for new plant. Alterations and improvements also will be made in existing structure. Cost over \$45,000 with equipment.

North American Refining Co., Shelby, Mont., has approved plans for new oil refinery at Chinook, Mont., with steel tank storage and distributing facilities, power house, pumping station and other structures. Cost over \$100,000 with equipment. A. H. Dorn, Chinook, secretary, is in charge.

United States Engineer Office, Fort Peck, Mont., asks bids until March 6 for machine screws, nuts, washers, wire wheel brushes, grinding wheels and other equipment; also for two pair of railroad car replacers (Circular 241).

Northern States Power Co., Minneapolis, Minn., has arranged appropriation of \$4,550,900 for expansion and improvements in power plants and system this year, including equipment for increased capacity and moderniza-

tion, transmission and distributing lines, power substations and other operating structures.

Bureau of Reclamation, Denver, asks bids until March 15 for two hydraulic turbines, two electric generators and two oil-pressure governors for turbine units (Specifications 831).

Trane Co., La Crosse, Wis., manufacturer of heating and ventilating equipment, space heaters, etc., closes bids March 3 for factory addition, 80 x 260 ft., one-story and part basement, designed by Parkinson & Dockendorff, local architects. With equipment, investment will be about \$75,000.

◀ PACIFIC COAST ▶

Bureau of Yards and Docks, Navy Department, Washington, has let general contract to Barrett & Hilp, 918 Harrison Street, San Francisco, for super-structure for one-story machine shop at Mare Island Navy Yard, 250 x 900 ft., at \$414,500, exclusive of equipment (Specifications 8995).

Board of Education, Civic Auditorium, Civic Center, San Francisco, has let general contract to Anderson & Ringrose, 320 Market Street, for unit No. 2 at Samuel Gompers Trade School, at \$141,000; exclusive of equipment.

United States Rubber Co., Samson Tire & Rubber Division, 5725 Anaheim-Telegraph Road, Los Angeles, automobile tires and tubes, has let general contract to Lindgren & Swinerton, 605 West Olympic Boulevard, for one-story addition for storage and distribution. Cost about \$90,000 with equipment. Harry T. Miller, 4814 Loma Vista Street, is architect.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until March 14 for boiler tube brushes and brush refills (Schedule 5685); until March 21, centrifugal pumps and spare parts and tools (Schedule 5683) for Mare Island Navy Yard.

Board of Education, Glendale, Cal., plans one-story vocational shop at new multi-unit Woodrow Wilson Junior High School, for which bids will be asked on general contract in spring. Cost over \$500,000. William Mellem, 1661 Beverly Boulevard, Los Angeles, and Erwood P. Eiden, 106 East Wilson Avenue, Glendale, are architects.

Water Department, Tacoma, Wash., W. A. Kunigk, superintendent, will take bids soon for new pumping station at South Tacoma in connection with extensions and improvements in water system, including four vertical pumping units and auxiliary equipment, each 3500 gal. per min. capacity; two deep-well pumping units, with combined capacity of 8400 gal. per min.; automatic gates for pumping station; complete electrical equipment, with switchboard and controls, and one 3-ton crane.

Bureau of Yards and Docks, Navy Department, Washington, asks bids until March 8 for pumping machinery and auxiliary equipment for Puget Sound Navy Yard (Specifications 8970); also bids (no closing date stated) for capstans and electrical installation in capstan pits, same yard (Specifications 8996).

◀ FOREIGN ▶

General Motors-Holden's, Ltd., Sydney, New South Wales, Australia, has approved plans for new automobile plant at Pagewood, New South Wales, comprising several one-story units for parts production and assembling. Cost about \$1,250,000 with machinery.

Ayr Tack & Nail Co., Ltd., Ayr, Ont., manufacturer of wire nails, etc., has plans for one-story addition, 70 x 135 ft. Cost close to \$50,000 with equipment.

St. Maurice Power Co., Power Building, Montreal, an interest of Shawinigan Water & Power Co., same address, has had plans approved by Provincial Government for new hydroelectric generating plant on St. Maurice River, near Latuque, Que. Project will include a 100-ft. power dam, power house, power substations and switching stations, with transmission line for connection to present high-tension system. Cost close to \$20,000,000.

THIS WEEK'S MACHINE ...TOOL ACTIVITIES...

*... Better sales outlook reported in several centers ...
Inquiries more general ... Chevrolet to spend \$2,000,-
000 for new plant near Buffalo.*

Better Sales Outlook Cheers Chicago Dealers

CHICAGO—The spirit of optimism expressed here over the past two weeks continues unchecked. One sales office reports February as the best month since 1937. Small tool orders, which last month showed a 20 per cent increase over December, were expected to show a further rise in February. Some railroad buying is anticipated before long, but the carriers currently are emphasizing equipment more than machine tools. Several large die and tool shops have lately been in the market, and some farm equipment firms other than the International Harvester Co., whose large buying program continues, have been active customers.

The Barnes Drill Co., Rockford, recently shipped to Russia what is said to be the largest honing machine ever built, with a stroke of 76 ft. and capacity to handle a 32-in. bore. The reported largest radial drill ever constructed also was just recently shipped, by the Carleton Drill Co. to a Cleveland consumer.

Spotty Improvement in Orders Reported in the East

NEW YORK—As a result of the placement of a few orders for large machinery by general industrial buyers, dollar volume of sales rose sharply for some dealers last week. Others reported light sales. Inquiries are more active and there is every indication that general industry will be a much more active buyer of machine tools in 1939 than in 1938. Meanwhile aircraft engine and parts manufacturers continue to go ahead with expansion and replacement programs. Government business was light last week.

Deliveries have already begun of the \$900,000 worth of machine tools and machinery to be housed in the addition to the Glenn L. Martin Co. plant at Middle River, near Baltimore. Including machinery, the total cost of the expansion will be in the neighborhood of \$2,750,000 and will give the Martin company 440,000 sq. ft. of additional space for manufacturing use.

\$2,000,000 Buffalo Project To be Started by Chevrolet

DETROIT—First indications of a major automotive program comes with the knowledge that Chevrolet plans future expansion of facilities near Buffalo. Soon to be announced is a \$2,000,000 project on which work will probably start this coming summer. Prospects that a new factory will be built for the manufacture

of leaf spring automobile seats also were revealed last week. A decision on this construction is expected soon.

Cincinnati Builders Report Bookings at Steady Pace

CINCINNATI—The machinery market, while not buoyant, is moving at a steadily conservative pace. Bookings the past week were about equal to those of the preceding period. Current business is strengthening market morale and the trade generally tends to be more optimistic. Demand is not changed greatly in character, foreign business still commanding greatest quantity. The steadiness of

domestic ordering with fluctuations generally upward, contributes stability to the market tone.

Inquiry is steadily brisk and indicates user desire to consider retooling needs. Plant operations have not changed materially from the 50 per cent level.

Market Quieter in Northern Ohio

CLEVELAND—Dealers report the market has been more quiet during the past week. Inquiries have not been so plentiful. Activity in used tools and small equipment has been fairly well maintained. A number of local sellers participated in a school job of 16 to 18 items in Ashland, Ohio; one of the railroads bought a small grinder; and a few more lathes have been purchased.

Machine tool buying is definitely on the upturn, according to salesmen of the Warner & Swasey Co. who attended the company's annual sales conference, held here last Friday and Saturday. Salesmen from practically every sales territory in the United States and Canada said they anticipated an increase in orders during the coming months and that inquiries are now on the increase from almost every line of industry.

. GREAT BRITAIN .

*... Steel cartel meeting on
March 8 to consider American
competition.*

LONDON, Feb. 28 (By Cable)—The tendency toward improvement has continued with increasing home and export demand. Shipbuilding is still idle but railways are better buyers and armaments and air raid defense are consuming large tonnages, especially of sheets and light constructional steel.

Pig iron makers are more active, taking increasing quantities of iron ore. The talk of a reduction of foundry prices after the end of March is retarding forward sales.

The Continental market is still quiet with persistent complaints of American competition in plates in several European countries and wire rods in Switzerland. The organizing committee of the Steel Cartel will meet in Luxemburg on March 8, when American competition is expected to be freely discussed. The rail cartel meets in Luxemburg on March 9. The tube cartel quota difficulties following Czechoslovakian cession to Germany is reported settled.

Galvanized sheet makers are fully employed on air raid shelters, but export is still negligible.

United Kingdom finished steel output last year amounted to 7,500,000 tons; of which tin, terne and black plate accounted for 610,000 tons; galvanized sheets for 248,000 tons.

There is brisk demand for tin plate and unfilled orders are now over 3,000,000 base boxes. The usual big Canadian order has now been received, so that makers will now have about 4,000,000 base boxes on order. More mills have been started up, and the recent output of 47 per cent is now expected to go higher. South America, Australia and the Continent are the best buyers.

Stearns Magnetic Mfg. Co., Milwaukee, maker of magnetic separators, magnetic clutches and brakes, has concluded arrangements with the Exolon Co., Bladell, N. Y., whereby the Stearns organization will manufacture and sell Exolon machines. The Stearns company announces the appointment of W. E. Craner as its representative in Houston, Tex.

Hickman, Williams & Co. has been appointed exclusive agent for the sale of Citizen's Indianapolis by-product foundry and domestic coke by the Citizen's Gas & Coke Utility, Indianapolis. The Indianapolis office of Hickman, Williams & Co. is at 801 Majestic Building. Other offices are located in Chicago, Minneapolis, St. Louis, Cleveland, Cincinnati, Detroit, New York, Philadelphia and Pittsburgh.

Detroit, Michigan



March 13-18 1939

AMERICAN SOCIETY
of
TOOL ENGINEERS'
Exhibition Section of
THE IRON AGE





WALTER F. WAGNER
President, American Society of Tool Engineers

What IS a Tool Engineer? Industry's Strategist!

By WALTER F. WAGNER
Master Mechanic, Lincoln Motor Co.

IN the early days of the machine age, an engineer designed a product and turned it over to the production man to build. The latter made his patterns, whittled out the parts as best he could, figured up his costs and handed the product to the sales department to sell. Price was determined after—not before—production started.

The salesman's job was not too hard. The products which the "machine" had made possible inevitably were so much lower in price than the previously hand-made articles—if prototypes existed—that any factory which was able to turn out a large number of products ahead of others was almost bound to be successful in its sales efforts. Industry then enjoyed a seller's market.

As the manufacture of machine-made products became more common and competition developed, there arose the necessity for a new industrial science—the science of economic production. In order that more and more people might enjoy more and more comforts and conveniences, costs had to be as low as possible. Industry began to recognize that production planning and costing had become as necessary as the engineering which conceived or the manufacturing which actually produced the article.

New Jobs for "Machine-Minded" Men

Out of the ranks of the production division there came a group of men on whom these new responsibilities were placed. They were men who understood machines—who knew their capabilities and their limitations—men who could visualize the evolution of a finished article from raw materials as a series of manufacturing operations—men who could figure to a fraction of a cent what it would cost to do the same job this way or another—men who could conceive and design new machines, new equipment, new tools to do some job that could not be done with what was already available.

This new practical scientist of industry we have come to call a tool engineer is the organizer of the batteries of machines, tools and equipment that characterize modern industry. He knows their idiosyncracies and capabilities. It is his job to fit each one into its proper place so that the whole may operate smoothly under the field generalship of the manufacturing division, executives and workmen alike. He must select the right processes, the right equipment. Each machine must be properly provisioned with the right kind of tools and fixtures so that it can carry out its particular assignment effectively.

Manufacturing Strategists

He is industry's new manufacturing strategist who, more and more, is becoming the final judge as to whether a new idea is economically feasible. When he has made his decision his, frequently, is the responsibility of showing how the desired end can be attained.

He is industry's unsung "man behind the scenes." It is on him that the problem devolves of converting an engineer's conception into not only a produceable, but also a salable reality. His problem in most cases requires far more inventive ability and engineering ingenuity than the design of the product or unit to be produced. His is the responsibility of determining how to produce industry's products at lower and still lower costs. This is the job of keeping prices down while costs of labor and raw materials continue to rise.

Without him, the best engineered product might never reach the market—or if it did—languish on dealers' shelves because of too high a cost. Without his knowledge, machines, equipment, and tools might well be so many tons of cold and idle metal.

His is not the glory coming to the sales manager when
(CONCLUDED ON PAGE 22)

The Tool Engineer and Today's Production

By JAMES R. WEAVER

Director, Equipment, Purchases, Tests and Inspection, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.



JAMES R. WEAVER
First Vice-President, A.S.T.E.

SOCIETY is under heavy indebtedness to the tool engineer for the comforts and luxuries of today. Without the tool engineer, low mass production would be impossible because of prohibitive tool and manufacturing costs. The machine would be of no benefit to us if the tool engineer did not design and apply proper tools to be driven by the machine.

Shorn of all its mystery, a machine is only a system of levers for applying power to the cutting tool, plus a system of cams for timing the application of power. The feature that distinguishes the automatic machine from the general purpose machine is self-timing, usually obtained through a proper arrangement of cams.

The tool engineer as we know him in the average industrial plant is the person responsible for the design and application of the tools driven by the machine. These tools comprise punches, dies, jigs, fixtures, timing relays, limit switches, and all the different kinds of cutting tools. He must also interest himself in machine and tool maintenance, acquaint himself with new tools as they are put on the market and design special tools for particular applications.

In the language of the theater, "the show must go on." But in industry, it is "production must go on." Hence, the first duty of the tool engineer is to keep production going. He must answer all trouble calls at the time he receives them; he cannot put them on his calendar. As a "trouble shooter," he must depend on his experience and ingenuity in meeting emergencies. But, better than answering trouble calls, the good tool engineer will have a planned maintenance program so that troubles are foreseen and steps taken to correct them before they develop. This is not difficult if proper supervision is exercised over machine and tool equipment by means of regular and proper inspection. A study of the quality of the product which comes from a machine will oftentimes indicate trouble in the

future. If the condition is corrected, the trouble will not occur. A study of the quality of the product will indicate whether a machine needs a general overhauling, or only minor repairs. This, the tool engineer must decide.

Sometimes the quality of the product, especially surface finishes and dimensions, are affected by the manner in which cutting tools are ground. The tool engineer is called upon to specify the shape of the tool, its hardness, speed at which it shall be driven, amount of feed, and above all, the method of clamping the tool to avoid chattering.

The tool engineer's biggest responsibility is the tooling of new jobs as they come from the engineering department. The design engineer may design a beautiful piece of apparatus. But it is up to the tool engineer to design and build tools which will make possible the manufacture of the particular piece of apparatus at a profit. The tool engineer must be able to work from a blueprint of the new apparatus, which might be a push button, a sewing machine or a new locomotive. The Boulder Dam gates and the horseshoe bearing for the Mt. Palomar 200-in. telescope were made possible only through the ingenuity of tool engineers. But, an every day job like tooling for a new line of motors requires as much skill, training and resourcefulness on the part of the tool engineer.

One of the first questions which a tool engineer must answer is what method to use in building his tools. In the last two or three years, great strides have been made in joining metals by copper brazing. Hence, the tool engineer does not machine die strippers and guide rings from solid steel. He takes a stack of laminations of the proper thickness and copper brazes them together under pressure in an atmosphere controlled furnace. This copper brazing method makes better die accessories than if machined from the solid. To further increase the life of lamination dies,

he has increased die clearance to as much as 0.0015 in. or 0.002 in. To facilitate the grinding of the shearing angle on these dies, he has mounted a high speed grinder on the ram of a boring mill.

In order to make the boring mill safe for this and other work, a guard is put around the table. This consists of 2 in. x $\frac{3}{8}$ in. strap steel bands bolted by means of suitable brackets, to the base of the mill at a suitable distance from the table.

A tool engineer must be ever alert for new developments and must be able to adapt them to his use. For example, an ordinary limit switch mounted on the side of a spray booth will save power and prolong the life of the bearings of the exhaust fan and its driving motor. When the operator finishes spraying, he hangs his spray gun on the arm of the limit switch which opens the switch and stops the motor and the fan. When he picks up the gun for his next job, the switch is closed and starts the motor and exhaust fan.

We have said something about the work of the tool engineer. We have shown that he performs many duties and does many things ordinarily not associated with the work of a tool engineer. The fact is that as far as tools and machine equipment are concerned, he is responsible for keeping production going and keeping it going at an ever decreasing cost. It is his job to keep all machine tool equipment in a good state of repair, work closely with the tool room so as to control the purchase of small standard tools, and see that workers are properly instructed in the use of such tools so that they will not be abused.

The tool engineer receives his education from many sources, Membership in engineering societies is valuable, especially if he becomes active in their proceedings. Attendance at machine and tool exhibitions is important. At these places, he sees new tools, often in actual operation, and he talks first hand with people who understand these tools and can tell him just how they fit into his own production methods. He meets other tool engineers and exchanges ideas with them. By means of inspection trips, he is able to visit the most progressive industrial plants in the district and pick up valuable information on new methods. From these meetings and exhibitions, the alert tool engineer will bring back to his plant, ideas which he can incorporate directly in his manufacturing practice. But the greatest good will accrue to him only if he takes in the technical sessions, even though he is not one of the few who present papers.

From the knowledge gained at these tool shows come many cost reduction ideas and short cuts in manufacturing. Modern equipment exhibited may cause present equipment to become obsolete. But to decide when equipment is so obsolete as to make replacement economical requires a knowledge of tool values and costs of manufacturing. The cost of the new machine and the book value of the present equipment must be paid for from savings accruing from the lower manufacturing costs made possible by the new equipment. The tool engineer must be familiar with costs of manufacture as well as costs of new equipment in order

to act intelligently in regard to obsolescence and replacement of equipment. Sometimes complete replacement is not justified but modernization is required.

In that case, the tool engineer must know what attachments are available on the market and what he must design and build in his own shop. A combination punch and shear can be speeded up if a turret head, holding an assortment of punches, is installed on the punch slide. An attachment can be put on a buffing machine which will hold parts and feed them against the buffing wheel at the rate of 1500 per hr. Ordinarily, these attachments do not come full blown and ready for use. Some adaptation is required in order to get the greatest utility from them. Here, again, the tool engineer's ingenuity finds full play, for it depends on him whether or not the attachment turns out to be a money saver.

The tool engineer cannot confine his interests only to tools in the strictest sense of the term. He must interest himself in plant layout and handling methods so as to determine whether or not machines are arranged for the performance of operations in proper sequence. He must decide if the layout warrants establishing a sub-toolroom to serve the department. This is particularly important when a large amount or a variety of small tools and cutters are used for production.

The place of the tool engineer in today's picture cannot be denied. He is as important as the design engineer. He holds the key to today's production methods. James Watt rejoiced when he was informed that his steam cylinders could be bored true to within the thickness of a thin shilling. When Johanson exhibited his first set of gage blocks, the mechanical world thought he had wrought a miracle in production methods. Today, millions of parts are finished to within 0.0001 in. every day in production quantities and by the use of relatively unskilled labor. The tool engineer has transferred the skill from the man to the machine in a very definite manner. The result has been two-fold; undreamed luxuries of yesterday have become the commonplace necessities of today; the unskilled laborer of today receives higher wages than the skilled artisan of yesterday.

The need of industry today is the training of skilled tool engineers. Formal training in mechanical engineering and industrial management is not sufficient as it leaves out the painful and tedious acquisition of familiarity with shop tools. It is industry's responsibility to supply this training through apprenticeship courses and the encouragement of attendance at machine and tool shows. The technical societies cannot do this without the support of industry and industry should recognize this responsibility and not take a "Let George Do It," attitude. Industry can cooperate by supporting a three point program:

- I. Supply exhibits for the shows.
- II. Encourage qualified individuals to attend these shows.
- III. Encourage those tool engineers who are at the top of the profession to present papers at the technical meetings, and encourage others to take part in the discussions at these meetings.

Program of A.S.T.E. Annual Meeting and Machine and Tool Progress Exhibition

Monday, March 13

Preview dinner for invited leaders in industry, education and religion
Subject: The Relationship of Machines to Employment and Standard of Living

Tuesday, March 14

9.00 a.m. Machine & Tool Progress Exhibition opens at Convention Hall, Detroit
Registration for show and plant inspection tours
1.30 p.m. Plant inspection tours
6.00 p.m. Exhibits close

Wednesday, March 15

9.00 a.m. Exhibit opens
9.30 a.m. Plant inspection tours
1.30 p.m. Plant inspection tours
8.00 p.m. **Technical session, Convention Hall Annex**

A Symposium On Mechanical Surface Finishing

Chairman, C. J. Oxford, chief engineer, National Twist Drill & Tool Co.
Introduction and General Discussion, J. R. Weaver, director of equipment, purchases, tests, and inspection, Westinghouse Electric & Mfg. Co.

Grinding

Ira Snader, chief engineer, Ex-Cell-O Corp.

Honing

Kirke W. Connor, president, Micromatic Hone Co.

Lapping

H. J. Griffing, Norton Co.

Diamond Boring and Finishing

F. T. Ellis, Heald Machine Co.

Superfinishing

D. A. Wallace, president, Chrysler Sales Division, Chrysler Corp.

Measurements of Surface Finish

Dr. Ernest Abbott, president, Physicists Research Co.

10.00 p.m. Exhibits close for the day

Thursday, March 16

9.00 a.m. Exhibit opens
9.30 a.m. Plant inspection tours
10.00 a.m. Board of directors meeting, Fort Shelby Hotel
1.30 p.m. Plant inspection tours
6.00 p.m. Exhibit closes
6.30 p.m. **Annual Dinner**, Book-Cadillac Hotel
Report of national officers
Installation of new national officers
Dinner speaker: William B. Stout

Friday, March 17

9.00 a.m. Exhibit opens
9.30 a.m. Plant inspection tours
10.00 a.m. Standards Committee meeting, Fort Shelby Hotel
1.30 p.m. Plant inspection tours
8.00 p.m. **Second Technical Session, Convention Hall Annex**
Subject: New Developments and Their Effect on the Tool Engineer
Chairman, Chris Borneman, supervisor, tool and gage department, General Electric Co.

Hydraulic Units

K. R. Herman, vice-president of Vickers, Inc.

Gages

C. Johnson, Pratt & Whitney Division, Niles-Bement-Pond Co.

Cutting Tools

L. C. Gorham, Gorham Tool Co.

Gear Tooth Finishing

R. Drummond, National Broach & Machine Co.

Effect of Lapping or Honing of Cutting Edges of Tools

John Lindegren, Crompton & Knowles Loom Works

10.00 p.m. Exhibit closes

Saturday, March 18

9.00 a.m. Exhibit opens
9.30 a.m. Tour of Greenfield Village
6.00 p.m. Close of Machine and Tool Progress Exhibition

Plant Inspection Tours

Cadillac Motors Co.
Chrysler Motor Co.
DeSoto Motor Co.
Dodge Motor Co.
Dodge Truck Co.
Hudson Motor Car Co.
Packard Motor Car Co.
Plymouth Motor Co.
Rotary Electric Steel Co.
Timken-Detroit Axle Co.
U. S. Rubber Products Co.

In addition to this list about 25 smaller plants of all descriptions will be open for inspection to those properly registered.



GEORGE A. SMART
Second vice-president, A.S.T.E., and tool
supervisor, Acme Machinery Co.



FRANK R. CRONE
Treasurer, A.S.T.E., and chief tool de-
signer, Lincoln Motor Co.

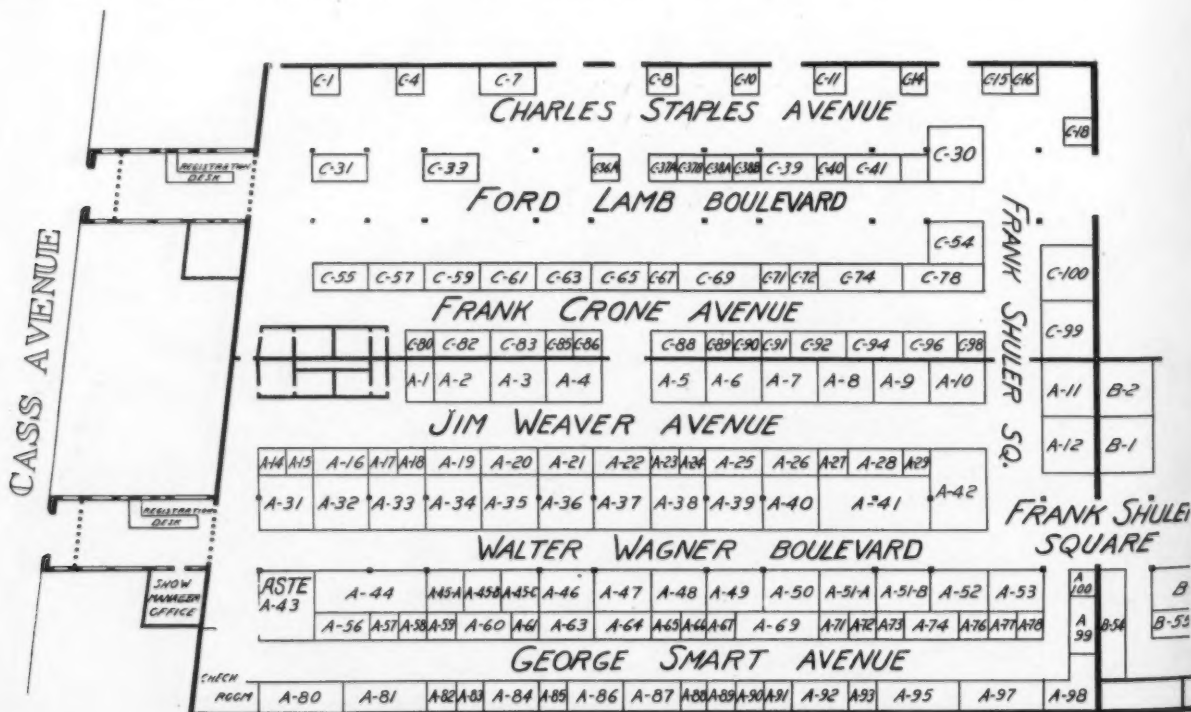


CHARLES F. STAPLES
Secretary, A.S.T.E., and tool engineer.

LIST OF EXHIBITORS AT AMERICAN SOCIETY

	BOOTH NO.
ABRASIVE CO.—Philadelphia	A-19
ABRASIVE DRESSING TOOLS CO.—Detroit	A-1
ALLEN MFG. CO.—Hartford, Conn.	B-68
ALLIS-CHALMERS MFG. CO.—Detroit	A-69
AMERICAN BROACH SALES CO.—Ann Arbor, Mich.	C-14
AMERICAN EQUIPMENT CO.—Detroit	A-4
A.S.T.E. & BRAMSON PUBLISHING CO.	A-43
AMERICAN MACHINIST—New York	A-98

	BOOTH NO.
AMERICAN OPTICAL CO.—Southbridge, Mass.	B-100
AMERICAN SAW & MFG. CO.—Detroit	B-10
AMERICAN SWISS FILE & TOOL CO.—Elizabeth, N. J.	B-100
APEX MACHINE & TOOL CO.—Dayton, Ohio	A-58
ARMSTRONG-BLUM MFG. CO.—Chicago	C-69
ARMSTRONG BROTHERS TOOL CO.—Chicago	C-68
ATLAS PRESS CO.—Kalamazoo, Mich.	A-16
AUTOMOTIVE MAINTENANCE MACHINERY CO.—Chi- cago	B-24





FORD R. LAMB
Executive-secretary, A.S.T.E.



JOHN S. BARTEK
Chairman of Rochester Chapter and
chief engineer, Modern Tool Works Div.,
Consolidated Machine Tool Corp.



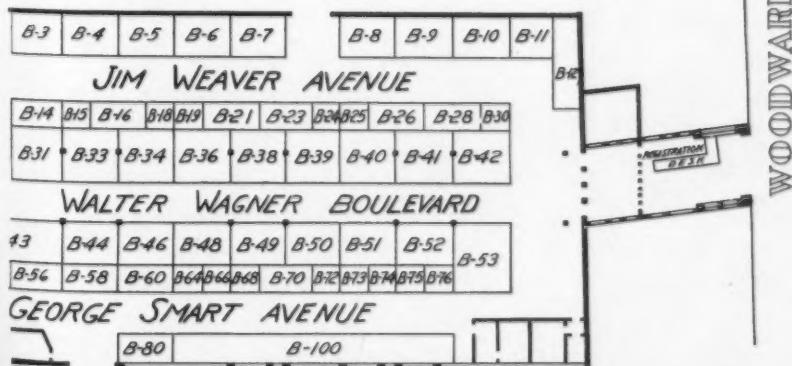
EUGENE BOUTON
Chairman of Racine Chapter and time
study supervisor, J. I. Case Co.

OF TOOL ENGINEERS' PROGRESS EXHIBITION

	BOOTH NO.
BARBER-COLMAN CO.—Rockford, Ill.	A-39
BARNES, W. O., CO., INC.—Detroit	A-85
BARRETT-CRAVENS CO.—Chicago	B-55
BATH, JOHN, CO.—Worcester, Mass.	A-3
BAUSCH & LOMB OPTICAL CO.—Rochester, N. Y.	B-74
BLACK & DECKER MFG. CO.—Towson, Md.	C-41
BLANK & BUXTON MACHINERY CO.—Jackson, Mich.	C-16
BOYAR-SCHULTZ CORP.—Chicago	C-82
BOYER-CAMPBELL CO.—Detroit	B-100

	BOOTH NO.
BRIDGEPORT MACHINES, INC.—Bridgeport, Conn.	A-77
BRISTOL CO.—Waterbury, Conn.	A-18
BROWN & SHARPE MFG. CO.—Providence	A-6
BRUNING, CHARLES, CO.—Detroit	A-38
ANDREW C. CAMPBELL DIV., AMERICAN CHAIN & CABLE CO.—Bridgeport, Conn.	B-8
CARBOLOY CO., INC.—Detroit	B-43
CARBORUNDUM CO.—Niagara Falls, N. Y.	A-2

FLOOR plan layout of Convention Hall in Detroit, showing the location of the various exhibitors' booths by key number. The aisles have been named in honor of the present national officers and past-president Frank A. Shuler, Chairman of the Show Committee.



PICTURED on these and following pages are the national officers of the American Society of Tool Engineers and the chairmen of the 23 chapters who have served for the 1938-39 society year. New national officers will be installed at the annual dinner on March 16, and new chapter officers will be installed at the April meetings in their respective districts.



E. W. DICKETT

Chairman of Rockford Chapter and proposal engineer, Sundstrand Machine Tool Co.



E. A. DOOGAN

Chairman of St. Louis Chapter and engineer, machine division, Hussmann-Ligonier Co.



CHESTER A. DUNDORE

Chairman of Bridgeport Chapter and tool supervisor, Underwood Elliott Fisher Co.

BOOTH NO.

CHARRON ENGINEERING SALES—Detroit	B-9
CHICAGO RIVET & MACHINE CO.—Chicago	A-99
CHILTON CO. (Automotive Industries)—Philadelphia	A-15
CHISHOLM-MOORE HOIST CORP.—Tonawanda, N. Y.	B-100
CHRYSLER CORP.—Detroit	A-12
CIRCULAR TOOL CO., INC.	A-91
COGSDILL TWIST DRILL CO.—Detroit	B-53
COLONIAL BROACH CO.—Detroit	A-42
COLONIAL BUSHINGS, INC.—Detroit	A-42
CONVENTION BINDER SERVICE—Chicago	A-72

BOOTH NO.

CRAFTS, ARTHUR A., CO., INC.—Boston, Mass.	C-10
CUSHMAN CHUCK CO.—Hartford, Conn.	B-52
DALRAE TOOLS CO.—Syracuse, N. Y.	B-3
DAVIS BORING TOOL CO.—St. Louis	A-100
DAYTON ROGERS MFG. CO.—Minneapolis	A-26
DAZOR MFG. CO.—St. Louis	B-76
DELTA MFG. CO.—Milwaukee	B-34
deSANNO, A. P., & SON—Philadelphia	A-78
DETROIT BROACH CO.—Detroit	B-60



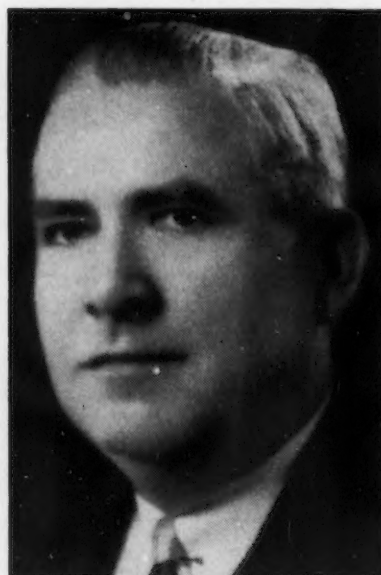
CONRAD O. HERSAM

Chairman of Philadelphia Chapter and consulting engineer, Industrial Consulting Engineering Co.



GREGORY P. GRACE

Chairman of Pittsburgh Chapter and general superintendent, Robertshaw Thermostat Co.



IRWIN F. HOLLAND

Chairman of Hartford Chapter and division superintendent, Pratt & Whitney Division, Niles-Bement-Pond Co.



FLOYD W. EATON
Chairman of Detroit Chapter



AUGUST EHRHARDT
Chairman of Toledo Chapter and process engineer, Spicer Mfg. Co.



EDWARD W. ERNEST
Chairman of Schenectady Chapter and superintendent, General Electric Co.

	BOOTH NO.
DETROIT POWER SCREW-DRIVER CO.—Detroit	C-89
DETROIT TAP & TOOL CO.—Detroit	A-42
DIETZGEN, EUGENE, CO.—Chicago	B-7
DUMORE CO.—Racine, Wis.	B-72
EAST SHORE MACHINE PRODUCTS CO.—Cleveland	B-16
ECLIPSE COUNTERBORE CO.—Detroit	A-80
ELECTRO-LIFT, INC.—New York, N. Y.	B-9
ELECTRO MATIC PRODUCTS—Chicago	B-21
ESCO ENGINEERING & SALES—Detroit	A-21

	BOOTH NO.
ETTCO TOOL CO.—Brooklyn, N. Y.	A-92
EXACT WEIGHT SCALE CO.—Columbus, Ohio	C-38-B
EX-CELL-O CORP.—Detroit	A-32
FALCON TOOL CO.—Detroit	C-32-A
FAUVER, J. N., INC.—Detroit	C-34
FEDERAL-MOGUL CORP.—Detroit	C-71
FEDERAL PRODUCTS CORP.—Providence	A-9
FELLOWS GEAR SHAPER CO.—Springfield, Vt.	A-31
FIRTH-STERLING STEEL CO.—McKeesport, Pa.	A-95



CLIFFORD E. IVES
Chairman of Chicago Chapter and owner, Ives Engineering Laboratories.



EARL V. JOHNSON
Chairman of Dayton Chapter and special engineer, Firth-Sterling Steel Co.



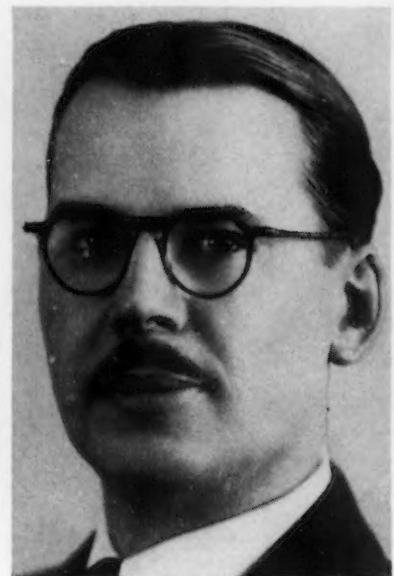
A. H. MITCHEL
Chairman of Syracuse Chapter and tool planning supervisor, New Process Gear Co.



GORDON L. REED
Chairman of Central Pennsylvania Chapter and chief engineer, York Corrugating Co.



OTTO R. RELLER
Chairman of Tri-Cities Chapter



PAUL F. ROSSBACH
Chairman of Cleveland Chapter and chief tool designer, Axle Division, Eaton Mfg. Co.

	BOOTH NO.
FORD MOTOR CO.—Dearborn, Mich.	A-23
FREDERICKSON CO.—Saginaw, Mich.	B-100
GAIRING TOOL CO.—Detroit	B-44
GALLAND-HENNING MFG. CO.—Milwaukee	C-72
GAMMONS-HOLMAN CO.—Manchester, Conn.	B-16
JAMES W. GEORGE—Detroit	A-41
GILMER, L. H., CO.—Philadelphia	B-100
GLENZER, J. C., CO.—Detroit	C-15
GODDARD & GODDARD, INC.—Detroit	A-86
GOODSPEED-DETROIT CO.—Detroit	B-16
GORHAM TOOL CO.—Detroit	A-36
GOVRO-NELSON CO.—Detroit	B-53
GREENFIELD TAP & DIE CORP.—Greenfield, Mass.	A-34
GRINDING MACHINERY CO.—Detroit	B-21
GROB BROTHERS—Grafton, Wis.	B-54
HAMILTON MANUFACTURING CO.—Two Rivers, Wis.	A-56
HAMMOND MACHINERY BUILDERS, INC.—Kalamazoo, Mich.	C-91
HANNA ENGINEERING WORKS—Chicago	B-9
HANNIFIN MFG. CO.—Chicago	A-33
HANSON-WHITNEY MACHINE CO.—Hartford	C-59
HARDINGE BROTHERS, INC.—Elmira, N. Y.	C-86
HAYNES-STELLITE CO.—New York	B-26
HEIM CO.—Fairfield, Conn.	B-16
HELLER BROTHERS CO.—Newark, N. J.	B-73
HOLE ENGINEERING SERVICE—Detroit	B-53
HOLO-KROME SCREW CORP.—Hartford	A-63
HOUGHTON, E. F., & CO.—Philadelphia	C-61
HOVIS SCREWLOCK CORP.—Detroit	B-19
HOWELL ELECTRIC MOTORS—Howell, Mich.	C-83
C. B. HUNT & SON—Salem, Ohio	C-32-B
HUOT MANUFACTURING CO.—St. Paul	B-75
ILLINOIS TESTING LABORATORIES, INC.—Chicago	B-25
ILLINOIS TOOL WORKS—Chicago	B-36
INDEPENDENT PNEUMATIC TOOL CO.—Chicago	C-33
INDUSTRIAL PRESS CO. (Machinery)—New York	C-55
INGERSOLL MILLING MACHINE CO.—Rockford, Ill.	A-8
INTERNATIONAL NICKEL CO., INC.—New York	C-65
IRON AGE (The)—New York	A-7
JACOBS MFG. CO.—Hartford	A-65
CHARLES L. JARVIS CO.—Middletown, Conn.	A-48
JOHNSON BRONZE CO.—New Castle, Pa.	C-8
JONES-FORS CO.—Detroit	A-57
JONES & LAMSON MACHINE CO.—Springfield, Vt.	A-50

	BOOTH NO.
KOEBEL DIAMOND TOOL CO.—Detroit	A-53
LEE MACHINERY CO., INC.—Detroit	A-28
K. O. LEE & SON CO.—Aberdeen, S. D.	B-16
LELAND-GIFFORD CO.—Detroit	B-70
LeMAIRE TOOL & MFG. CO.—Dearborn, Mich.	A-25
LENNEY MACHINE & MFG. CO.—Warren, Ohio	B-16
LINK ENGINEERING & MFG. CO.—Detroit	A-17
LOGANSPOUT MACHINE, INC.—Logansport, Ind.	A-4
LUFKIN RULE CO.—Saginaw, Mich.	A-74
McCASKEY REGISTER CO.—Alliance, Ohio	B-80
McCROSKY TOOL CORP.—Meadville, Pa.	A-45-A
MACKLIN CO.—Jackson, Mich.	B-5
MANUFACTURERS BRUSH CO.—Cleveland	B-100
MANUFACTURERS SALES CO.—Detroit	C-88 & C-90
MARBURG BROTHERS, INC.—New York	C-7
MARTINDALE ELECTRIC CO.—Cleveland	B-15
M-B PRODUCTS—Detroit	A-84
MICHIGAN TOOL CO.—Detroit	A-42
MICROMATIC HONE CO.—Detroit	C-96
MIDWEST PRODUCTION ENGINEERING CO.—Detroit ..	A-10
MIDWEST TOOL & MFG. CO.—Detroit	A-45-B
MILL & FACTORY—New York	C-6
MINSTER MACHINE CO.—Minster, Ohio	B-31
MODERN COLLET & MACHINE CO.—Ecorse, Mich.	B-58
MODERN MACHINE SHOP—Cincinnati	B-4
MORRISON MACHINE PRODUCTS DIVISION—Elmira, N. Y.	C-85
MOTOR TOOL MFG. CO.—Detroit	C-11
MUELLER BRASS CO.—Port Huron, Mich.	C-18
NATIONAL AUTOMATIC TOOL CO.—Richmond, Ind.	A-35
NATIONAL BROACH & MACHINE CO.—Detroit	A-49
NATIONAL TOOL SALVAGE CO.—Detroit	A-82
NEW BRITAIN-GRIDLEY MACHINE DIVISION, THE NEW BRITAIN MACHINE CO.—New Britain, Conn.	A-76
NEW METHOD STEEL STAMPS, INC.—Detroit	A-42
NIELSON, INC.—Lawton, Mich.	B-16
NICHOLSON FILE CO.—Providence	A-66
NORTON CO.—Worcester, Mass.	A-47
O. K. TOOL CO.—Shelton, Conn.	B-48
OZALID CORP.—New York	B-28
PARAGON REVOLUTE CORP.—Rochester, N. Y.	B-12
PARKER-KALON CORP.—New York	C-80
PEASE, C. F., CO.—Chicago	A-46



ELDRED A. RUTZEN
Chairman of Milwaukee Chapter and
tool engineer, Cutler-Hammer, Inc.



C. FRANK SHEELEY
Chairman of New York-New Jersey Chap-
ter and supervisor of tool design, Hyatt
Bearings Division of General Motors



HOWARD C. TAYLOR
Chairman of Buffalo Chapter and presi-
dent, Acme Pattern & Machine Co.

	BOOTH NO.
PFOIL, GEORGE H., INC.—Detroit	C-37-B
PHYSICISTS RESEARCH CO.—Ann Arbor, Mich.	A-59
PIONEER ENGINEERING & MFG. CO.—Detroit	C-78
POSITIVE SAFETY MFG. CO.—Cleveland	B-100
PRATT & WHITNEY DIVISION, NILES-BEMENT-POND CO.—Hartford	A-37
PREIS, H. P., ENGRAVING MACHINE CO.—Newark, N. J.	C-39
PRODUCTO MACHINE CO.—Detroit	C-36-A
PROGRESSIVE WELDER CO.—Detroit	C-30
PUTNAM TOOL CO.—Detroit	B-66
PYRO-ELECTRO INSTRUMENT CO.—Detroit	A-87
Q. C. ENGINEERING PRODUCTS—Detroit	A-5
RACINE TOOL & MACHINE CO.—Racine, Wis.	B-56
RAYL CO.—Detroit	A-67
READY TOOL CO.—Bridgeport, Conn.	A-90
REEVES PULLEY CO.—Columbus, Ind.	C-94
ROSS OPERATING VALVE CO.—Detroit	A-89
ROTOR AIR TOOL CO.—Cleveland	B-50
SCHAUER MACHINE CO.—Cincinnati	B-16
SCHERR, GEORGE, CO.—New York	C-57
SCHRAMER'S, SON, A., DIV. OF SCOVILL MFG. CO.—Brooklyn	C-67
SCULLY-JONES & CO.—Chicago	C-63
SEAMLEX CO.—Long Island City, N. Y.	B-16
SEVERANCE TOOL MFG. CO.—Saginaw, Mich.	A-88
SHAKEPROOF LOCKWASHER CO.—Chicago	B-36
SHEFFIELD GAGE CORP.—Dayton, Ohio	B-1
SIEWEK TOOL CO.—Detroit	C-40
SINGER SEWING MACHINE CO.—New York	A-40
SKINNER CHUCK CO.—New Britain, Conn.	B-100
SMITH, ROY—HOBART WELDING SALES & SERVICE	C-98
SNYDER TOOL & ENGINEERING CO.—Detroit	B-46
SOCONY-VACUUM OIL CO.—Detroit	B-49
SOUTH BEND LATHE CO.—South Bend, Ind.	A-28
STANDARD GAGE CO.—Poughkeepsie, N. Y.	A-52
STANDARD SHOP EQUIPMENT CO.—Philadelphia	A-29
STANLEY ELECTRIC TOOL DIVISION, THE STANLEY WORKS—New Britain, Conn.	B-18
STARRETT, L. S., CO.—Athol, Mass.	A-64
STEEL, PENTON PUBLISHING CO.—Cleveland	A-60
STOKERUNIT CORP.—Milwaukee	A-81
STRAND, N. A., & CO.—Chicago	B-100
STRELINGER, CHAS. A., CO.—Detroit	C-74
STRONG, CARLISLE & HAMMOND CO.—Detroit	A-83

	BOOTH NO.
STUART, D. A., OIL CO.—Chicago	A-97
SUNNEN PRODUCTS CO.—St. Louis	B-53
SUPER TOOL CO.—Detroit	A-22
SUTTON TOOL CO.—Detroit	A-45-C
SWARTZ TOOL PRODUCTS CO., INC.—Detroit	A-14
SWEDISH GAGE CO. OF AMERICA—Detroit	A-24
Taft-Peirce Mfg. Co.—Woonsocket, R. I.	C-100
TANNEWITZ WORKS—Grand Rapids, Mich.	B-10
T C M MANUFACTURING CO.—Harrison, N. J.	C-36-B
TEXAS CO.—Chicago	C-37-A
THOMAS MACHINE MFG. CO.—Pittsburgh	A-20
TOMKINS-JOHNSON CO.—Jackson, Mich.	B-33
TOWMOTOR CO.—Cleveland	C-92
TUNGSTEN CARBIDE TOOL CO.—Detroit	A-42
UNITED STATES ELECTRICAL TOOL CO.—Cincinnati	A-71
UNIVERSAL HIGH-SPEED TOOL CO.—Cleveland	B-23
VANADIUM-ALLOYS STEEL CO.—Latrobe, Pa.	B-51
VAN DORN ELECTRIC TOOL CO.—Towson, Md.	C-41
VICKERS, INC.—Detroit	A-11
VICTOR SAW WORKS, INC.—Middletown, N. Y.	B-100
VINCO TOOL CO.—Detroit	C-1
VINE, R. A., MACHINERY CO.—Detroit	A-27
WALKER TURNER CO., INC.—Plainfield, N. J.	C-54
WELDING EQUIPMENT SUPPLY CO.—Detroit	C-42
WELDON TOOL CO.—Cleveland	A-61
WELTRONIC CORP.—Detroit	C-30
WESSON CO.—Detroit	B-14
WESTINGHOUSE ELECTRIC & MFG. CO.—E. Pittsburgh, Pa.	A-44
WESTLOF TOOL & DIE CO.—Detroit	C-38-A
WETMORE REAMER CO.—Milwaukee	A-93
WHITNEY METAL TOOL CO.—Rockford, Ill.	B-6
WILLEY'S CARBIDE TOOL CO.—Detroit	C-9-A
WILLIAMS, J. H., & CO.—New York	B-64
WILSON MECHANICAL INSTRUMENT CO., INC.—New York	B-30
WRIGHT MFG. DIVISION OF AMERICAN CHAIN & CABLE CO., INC.—Bridgeport, Conn.	A-73
YALE & TOWNE MFG. CO.—Philadelphia, Pa.	C-31
ZAGORA, J., MACHINE & GEAR CO.—Charlotte, N. C.	C-4
ZEISS, CARL, INC.—New York	C-99
ZIEGLER, WM. M., TOOL CO.—Detroit	C-1



LOUIS L. WEBER
Chairman of Cincinnati Chapter and
tool supervisor, Lodge & Shipley Machine
Tool Co.



GEORGE W. WISE
Chairman of Twin Cities Chapter and
tool room superintendent, Minneapolis-
Honeywell Regulator Co.



FRANK A. SHULER
Past-president of the A.S.T.E. and master
mechanic, Highland Park plant of the
Chrysler Corp.

What IS a Tool Engineer? Industry's Strategist!

(CONCLUDED FROM PAGE 12)

sales climb 25, 50—a hundred per cent. His is not the recognition going to the production executive who has turned out so many more of the same product without a serious hitch—nor the praise accorded to the management able to reduce prices while increasing profits to investors.

Production "Overhead"

Unfortunately he is classified within the ranks of the non-productive help—in the bracket of "overhead"—a burden industry always endeavors to curtail. More often than not his only satisfaction is in a job well done—a tough production problem licked—a few cents or dollars saved on each part here or there—a new way of processing a product leading to decreased costs, greater accuracy, higher efficiency.

Hard-headedly practical and intensely serious by nature, it was the Tool Engineer himself, who a few years ago decided that he needed a new kind of technical Society, where Tool Engineers could meet and interchange ideas and information of value.

Thus, back in 1932 during the nation's worst depression

—the A.S.T.E. was born—with 33 members. At first its growth was slow, confined largely to that heart of mass production industries—Detroit. Then, as word spread of the Society's activities, applications from various groups of Tool Engineers began to come in from different sections of the country.

In 1935 the first outside chapter was chartered—in Racine, Wis. Other chapters followed, reaching into New England in the East—St. Louis in the South—Minneapolis in the North. By the beginning of 1937 there were some seven chapters. That year the membership doubled, and seven new chapters were organized.

1938 has proved to be a repetition of the previous year. Again membership doubled and the number of chapters jumped to 25, including two Junior chapters in Detroit and Cleveland. And this is just a beginning. Before this appears in print at least one more chapter is to be added while others are in the process of formation.

This year the Society has launched upon one of the most important projects ever undertaken by an engineering society: An investigation into the relationship of the machine on employment and standard of living.

• • •